Snow accumulation on Ekströmisen, Antarctica, 1980-1996

Untersuchungen zur Schnee-Akkumulation auf dem Ekströmisen, Antarktis, 1980-1996

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1. INTRODUCTION

The mass balance of Antarctica is one of the central questions in today's climate discussion. The reaction of the large Antarctic ice sheet to a possible climate change might have serious consequences for the rest of the world.
In spite of almost 40 years (since the International Geophysical Year 1957/58) of intensive studies including aerial and satellite measurements we still do not even know the sign of the mass balance of this huge ice mass.
Ice shelves surrounding about 50% of the coast line play an important role in the study of the mass balance. Calving of icebergs at the ice shelf fronts is one of the main loss factors in the budget. Melting of snow at the surface is negligible, but melting of ice shelves at the front and bottom can be very important as recent measurements on different ice shelves have shown (Nixdorf et al., 1994, Corr et al., 1996, Jacobs et al., 1996). Transportation of snow by wind can locally contribute to both gain or loss of mass. The main gain factor is precipitation, which is extremely low in the interior of the continent, less than 50 mm/a on the high plateau. It increases gradually towards the coasts, where between 200 mm and 400 mm are measured (Schwerdtfeger, 1984). The steepest gradient is observed at the edges of the continent due to orographical effects and the change from continental to maritime climate. At the Antarctic peninsula even higher values occur, but only in a relatively small area.
One big problem in the determination of Antarctica's mass balance is the enormous size of the continent. Thus it has to be studied in different smaller areas.
This study concentrates on Ekströmisen, where the German research station „Neumayer“ is situated. It gives a summary of accumulation studies in this area and the spatial and temporal variation of accumulation will be discussed.

2. A BRIEF HISTORY OF MASS BALANCE STUDIES ON EKSTRÖMISEN

With an area of about 8700 km^2 Ekströmisen represents one of the smaller ice shelves. Situated in Dronning Maud Land, it reaches about 130 km southwards and is surrounded by the Søråsen in the west, Ritscherflya to the south, and Halvfarryggen on the eastern side.
The first „modern" expedition to this part of Antarctica was the Norvegia-Expedition of Riiser-Larsen in 1931. They found Kapp Norvegia and named the land behind the coast they were sailing along, Dronning Maud Land, in honour to the Norwegian queen.
The German Antarctic Expedition 1938/39 took with them two Dornier catapult hydroplanes on board the expedition ship „Schwabenland" (Herrmann, 1941). The first maps of the region between about 10°W and 20°E were obtained using aerial photographs (Ritscher, 1942) taken out of these planes. The area was called „Neu-Schwabenland".
The first to step on Dronning Maud Land were the members of the Norwegian-British-Swedish Expedition (the first international Antarctic expedition) of 1949-1952. They built an overwintering station, Maudheim, at the coast of Dronning Maud Land, east of Kapp Norvegia, on the ice shelf, which was later called Quarisen. The members of this expedition were the first, who carried out glaciological measurements in this area. On long summer sledge journeys to the mountain ridges in the South, they also crossed the Ekströmisen and carried out accumulation measurements there (Schytt, 1958a+b, Swithinbank, 1957).
In a tragic accident the expedition lost three men, Quar, Ekström, and Jelbart, when a weazel fell into the sea at the ice front (Giaever, 1955). The three ice shelves were named after them later.
Fig. 2.1 shows the described area with the places mentioned in the text.
In the end of the 1970s Germany decided to intensify its scientific activities in Antarctica and to build an overwintering station. During the austral summer 1979/80 a pre-site survey expedition tried to find a suitable place for the research station in the area of the Filchner-Ronne-Schelfeis (Kohnen, 1981). Due to extremely heavy sea ice conditions in the following summer the station could not be built on the Filchner-Ronne-Schelfeis, but the alternative place Atka Iceport had to be chosen. At the end of summer 1980/81 the Georg-von-Neumayer Station (GvN) was finished and a team of five men, including one scientist, prepared themselves for the first winter (Kohnen, 1981).
Since 1981 the accumulation has been measured continuously at a stake array south of the station. Additionally, firn cores were taken and snow pits were dug in variable time intervals, either by scientists coming only for the summer season or by overwinterers, most of them glaciologically interested meteorologists.
The first stake array was set up by F. Obleitner, who was the first scientist to

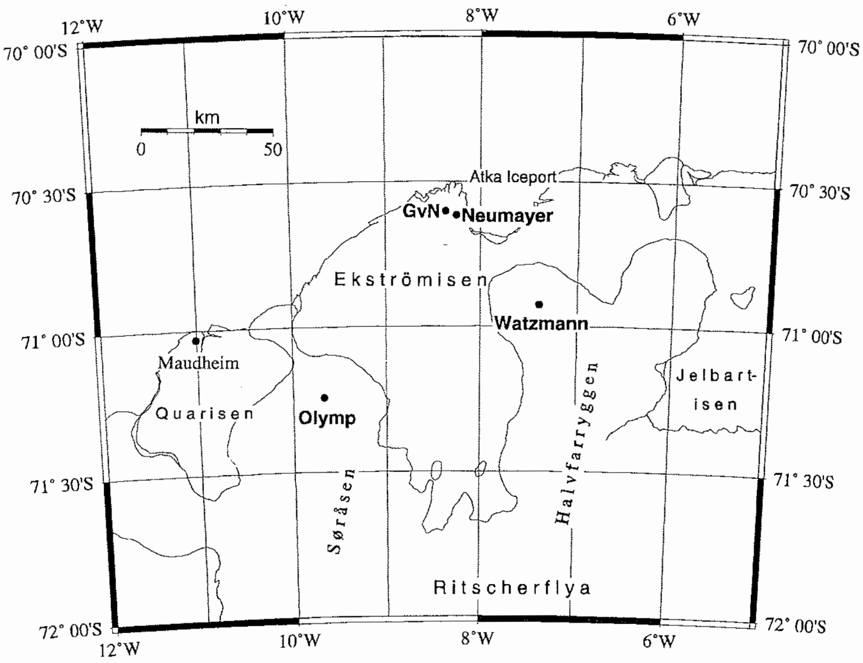

Fig. 2.1: Map of Ekströmisen and the locations mentioned in the text
(after IFAG, 1993)

winter over at GvN. The results of his studies of the glacio-meteorological conditions at GvN can be found in his thesis (Obleitner, 1987). Especially his careful stratigraphical analysis of snow pits and cores is still very valuable and helpful for the investigation of accumulation in later years, for which less data are available.
In later years new stake arrays were set up at different locations in the vicinity of the stations, up to a distance of about 70 km (Sturm, pers. comm.), and were observed over variable time periods.
During the first years the glacio-meteorological activities at GvN were mainly driven by the Kommission für Glaziologie der Bayerischen Akademie der Wissenschaften, München, and the GSF-Forschungszentrum für Umwelt und Gesundheit, München. The Institut für Umweltphysik der Universität Heidelberg was involved in the chemical analysis of snow samples. There has never been a continuous glacio-meteorological program, though.
In 1985/86 the first German land expedition started from Georg-von-Neumayer-Station southwards to the Heimefrontfjella. The expedition route was marked with bamboo poles, which were also used as accumulation stakes later (Miller and Oerter, 1990).
In the austral summer 1986/87 an intensive glaciological program was planned on the Filchner-Ronne-Schelfeis. But like in 1980/81 the heavy sea ice conditions did

not allow the German research vessel „Polarstern“ to reach the Filchner-Ronne-Schelfeis. So Ekströmisen was chosen for an alternative expedition, which proceeded 270 km southwards to a latitude of about 73°S. The aim of the so-called "Ekström-Traverse“ was to determine the spatial distribution of accumulation in the area of Ektrömisen and Ritscherflya. Along the expedition route seven snow pits were dug and 17 shallow firn cores (10 m) taken. Three deeper ice core drillings were carried out at two drilling locations. The chemical properties of these cores and pits were studied by Moser (1991). Additionally the accumulation since the year before was measured at the bamboo stakes (Miller and Oerter, 1990). This was repeated in 1989/90 during the „Kottas-Traverse“ (Patzelt and Rott, 1991).
During the summer 1991/92 a new station, Neumayer, was built about 7 km southeast of the old base, Georg-von-Neumayer Station, which had to be given up, because it was deformed too strongly due to ice movement. Adjacent to the new base Neumayer also a new stake net for accumulation studies was set up.
Since 1993 several traverses led south, especially in connection to the EPICA pre-site survey in Dronning Maud Land. During these expeditions no more firn cores were taken on the ice shelf, but the accumulation stakes were measured.

3. DATA

In spite of the lack of a continuous glacio-meteorological program on Ekströmisen, there is a surprisingly complete data set available, including stake measurements, data from snow pits and shallow firn cores, and surface snow samples.
Fig. 3.1 shows the location of stake arrays, snow pits and shallow firn cores in the vicinity of Neumayer. N, W, and S are stake arrays relatively close to the station.

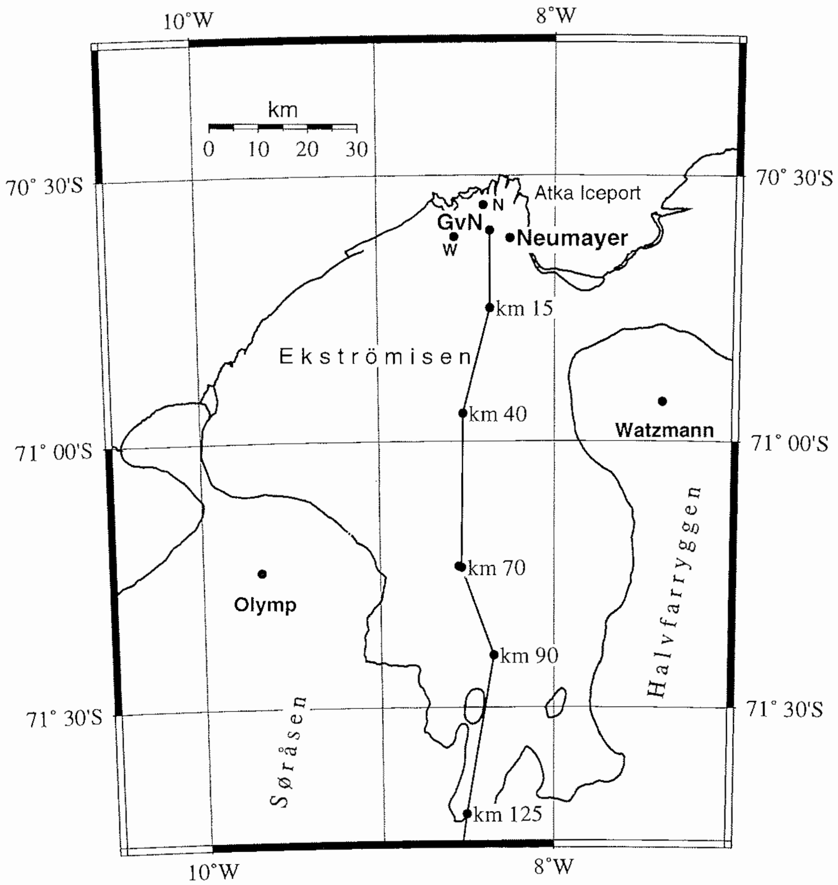

Fig. 3.1: Location of stake arrays, snow pits and cores mentioned in the text

3.1 Accumulation stake measurements

An array of accumulation stakes was installed 700 m south of GvN on 18.03.81 (Obleitner, 1987). Since that day the number of stakes and the site of the array were sometimes slightly changed, but the accumulation has been measured continuously until today. Except for the third overwintering year, 1983/84, during which the stakes were measured only monthly, the measuring interval was usually one week, sometimes even shorter.
In 1991/1992 the new station Neumayer was built about 7 km southeast of Georg-von-Neumayer Station. A new stake array 1 km south of Neumayer was established on 8.3.92 and this and the old one 1 km south of GvN were run simultaneously until 4.2.94, from then on only the measurements at the new array have been continued.
In 1987 another stake array was set up together with a little meteorological station 15 km south of GvN. The accumulation measurements have been carried out until today, but unfortunately the data between 28.2.88 and 20.3.90 are lost. Two more stake arrays north and west of the station (see Fig. 3.1) were run only during the overwintering 1987/88.
Also in 1987 the geophysicists installed a new seismic station at the Halvfarryggen, southeast of GvN, a new stake array close to the geophysical station followed. The same happened in 1989 at Søråsen, southwest of GvN.
Additionally, the stakes marking the route southwards to the Heimefrontfjella were measured whenever an expedition came along, starting in 1985/86, then again in 1986/87, 1989/90, 1995/96 and 1996/97.
Fig. 3.2 and Fig. 3.3 show the accumulation and yearly cumulative accumulation at GvN and at Neumayer, respectively. The complete data set of all stake arrays can be found in Appendix A.
The strong winds usually accompanying snowfall events make it impossible to measure precipitation „normally", using ombrometers. The accumulation determined using stake measurements does not exactly equal the precipitation, but it is as close as possible.
If snowfall and strong wind occur at the same time, snow is whirled up from the surface. Thus the snow particles suspended in the air represent not only the precipitation itself, but also particles coming from the ground. This is called „blowing snow". The vertical transport of snow particles due to turbulent diffusion is proportional to wind speed. Under undisturbed conditions, like above an ice shelf, a constant wind speed soon leads to a state of equilibrium with a constant particle concentration in the air. The particle flux from the surface to the air due to turbulent diffusion equals the sedimentation due to gravity. If the wind speed increases, more particles flow into the air, the snow surface is eroded. Decreasing wind speed means accumulation of snow on the ground. (Liljequist, 1979).
If there is snow in the air without snowfall, it is called „drifting snow". In most cases it is impossible to distinguish between blowing snow and drifting snow. A storm event can bring accumulation as well as ablation due to erosion of the snow surface. This can cause problems in dating snow pits, when whole layers are missing. Therefore in areas with strong wind influence stake measurements are necessary

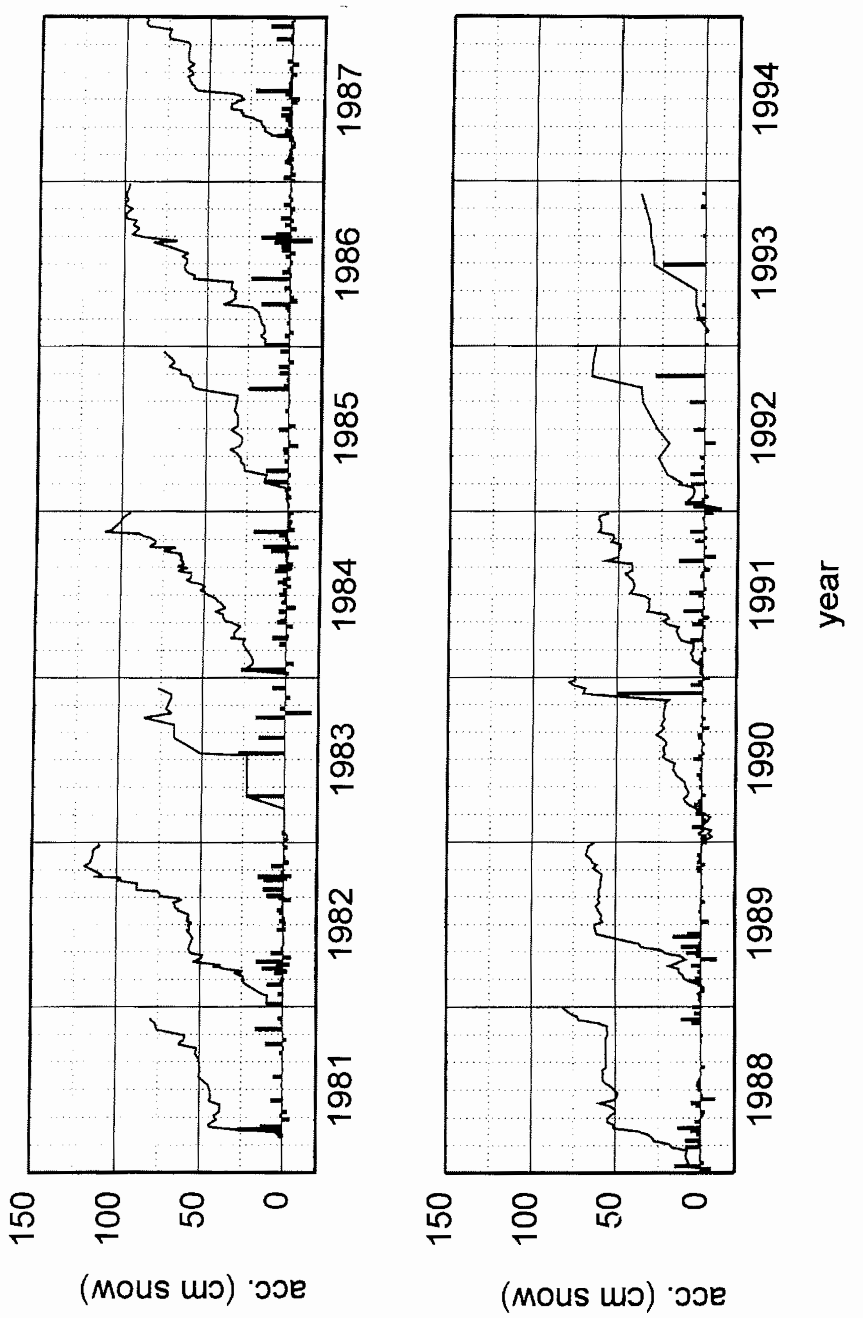

Fig. 3.2: Accumulation at Georg-von-Neumayer Station, 1981-1993

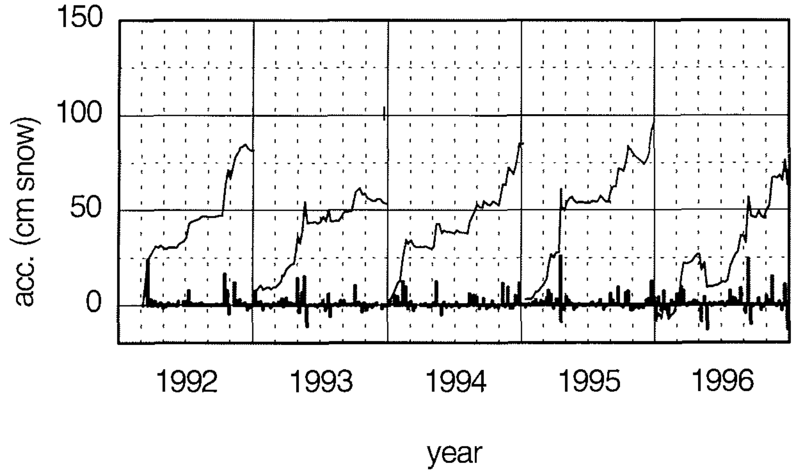

Fig. 3.3: Accumulation and cumulative accumulation at Neumayer Station 1992-1996

for an exact dating of snow pits and firn cores.

3.2 Snow pits

Snow pits were dug on several occasions, at GvN, Neumayer, „15km South", Halvfarryggen, and Søråsen, and along the expedition track to the South in 1986/87 (see Chapter 2). Usually density and sometimes temperature were measured immediately in the pits. Additionally a more or less exact stratigraphic description was given.
Snow samples were taken to determine electrolytical conductivity and oxygen and hydrogen isotope content (^{18}O, ^{2}H, deuterium excess d, ^{3}H).
Usually the dating of the pits was done using ^{18}O contents, which show a relatively clear seasonal variation. Visual stratigraphy and electrolytical conductivity, which also depends on the season, were helpful, when the isotope signal was not good enough for an exact dating. However, in many cases only part of the information, either isotope or visual stratigraphy, is available. Since advection of warm air masses is possible at any time of the year (the maximum temperature for August is -4.5°C !), peaks in the ^{18}O profile often cannot be clearly related to one summer. Here only the combination with core or stake data of the same site can help. For the pits and cores of the Ekström Traverse, for which no parallel measurements exist, some dating problems cannot be solved.
Table 3.2 shows the available snow pit data.

Tab.3.2: Snow pit data on Ekströmisen since 1980

Date	Loc.	Name	Publ.	Dens.	Strat.	Cond.	$\delta^{18}O$	^{2}H	d	^{3}H	Depth in m
Feb.80	GvN	Reinwarth et al.	Reinwarth et al., 1985	x	-	-	x	x	x	x	1.98
Feb.81	GvN	Reinwarth et al.	Reinwarth, 1982	x	-	-	x	x	x	-	3.60
June 82	GvN	Kipfstuhl	no publ.	-	-	-	x	x	x	-	0.5
Feb.83	7.5km SSW	Reinwarth et al.	no publ.	-	-	-	x	-	-	-	5.57
Feb.84	GvN	Reinwarth et al.	no publ.	-	-	x	x	-	-	-	1.21
April 87	GvN	Sturm	no publ.	x	x	x	-	-	-	-	2.0
May 87	15km S	Sturm	no publ.	x	x	x	-	-	-	-	1.6
Feb.88	GvN	Sturm	no publ.	x	x	-	-	-	-	-	2.05
March 90	GvN	Schlosser	no publ.	x	x	x	x	-	-	-	2.16
Jan.91	Søråsen	Schlosser	no publ.	x	x	x	x	-	-	-	2.45
Feb.91	Halvfar	Rainer	no publ.	x	x	x	x	-	-	-	1.92
Feb.91	GvN	Schlosser/ Rainer	no publ.	x	x	x	x	-	-	-	1.55
Dec.95	15km S	Hofinger	no publ.	x	x	a	a	a	a	a	2.38
Jan.96	NM	Hofinger et al.	no publ.	x	x	x	a	a	a	a	1.92

x: data available, a: analysis in progress, -: no measurement

3.3. Shallow firn cores

The first firn core was taken during the pre-site survey expedition at the planned alternative place for the future research station at Atka Bay (Reinwarth et al, 1982). The length of the core was 12 m, density, stratigraphy, conductivity, and oxygen and hydrogen isotopes were analysed. Dating and determination of yearly accumulation was done in the same way as for the snow pits. In cases of ambiguous yearly layers the tritium content can be used to support an exact dating.
Table 3.3 shows all available firn and ice core data.

3.4. Surface snow samples

Since the first overwintering year, additionally to snow pits and firn cores surface snow samples have been taken, mainly for determination of their isotope content. There are two types of surface snow samples: Usually the overwinterers took snow samples after snowfall events without strong winds, that means neither drifting snow nor blowing snow was observed. This should ensure that the samples had their origin in local precipitation. Since such events occur fairly seldom, additionally at the end of each month samples from a surface layer, which roughly represented the accumulation of this month, were collected under extremely clean conditions, so that they also could be analysed chemically.

For the years 1980 to 1990 the surface snow samples were used to investigate the dependence of ^2H and ^{18}O contents of precipitation on the meteorological situation at GvN (Pfaff, 1993).

Tab, 3.3: Shallow firn and ice core data on Ekströmisen since 1980

Date	**Loc./ core**	**Name**	**Publ.**	**Dens.**	**Strat.**	**Cond.**	^{18}O	^2H	**d**	^3H	**Depth in m**
Feb.80	GvN AB01	Reinwarth	Reinwarth et al, 1982	x	-	-	x	x	x	x	12.06
Feb. 82	GvN B04	Dörr/Reese	Reinwarth and Moser, 1990	x	-	(x)	x	x	x	x	52
Feb.82	GvN fbgvn0282	Reinwarth Obleitner	Obleitner, 1987	x	x	(x)	-	-	-	-	11.28
Feb. 82	GvN B03	Dörr/Reese	Jessberger and Dörr, 1982	x	-	-	-	-	-	-	68
1982/83	GvN B06	Bässler/ Reese	Jessberger and Bässler, 1983		*only*	*partly*	*anal*	*yzed*			200
June 87	GvN fbgvn0687	Sturm	no publ.	x	-	x	-	-	-	-	5.58
Dez.89	NM FB0189	Oerter	no publ.	x	x	x	x	-	-	-	10
Dez.89	GvN	Nishio, Mair, Pfaff	no publ.	x	x	x	x	-	-	-	12.7
March 92	NM FB0192	Oerter	no publ.	x	x	x	x	-	-	-	9.8
1986/87	km2 E002	Reinwarth et al.	Miller and, Oerter, 1987	x	-	x	x	x	x	-	10.11
1986/87	km40 E040	Reinwarth et al.	Miller and Oerter, 1987	x	-	x	x	x	x	-	9.66
March 95	NM FB0595	Hofinger et al.	no publ.	x	x	x	x	-	-	-	10.71
April 95	Halvfar-ryggen fbhv0495	Hofinger et al.	no publ.	a	a	a	a	a	a	a	11.0
May 95	15km S fb15S595	Hofinger et al.	no publ.	a	a	a	a	a	a	a	10.25

x: data available, a: analysis in progress, -: no measurement

Loc.: Location of drilling
core: Core label
Name: Scientist involved in coring/digging
Dens.: Density
Strat.: Visual stratigraphy
Cond: Electrolytical conductivity
GvN: Georg-von-Neumayer Station
NM: Neumayer Station

4. COMPARISON OF STAKE MEASUREMENTS, SNOW PITS, AND CORES

4.1. Comparison of stake measurements at GvN and Neumayer

As mentioned in Chapter 3 accumulation at the stake arrays of the old station GvN and the new station Neumayer has been measured simultaneously for about twenty months. Fig. 4.1 shows the cumulative accumulation for GvN and Neumayer for the years 1992 and 1993

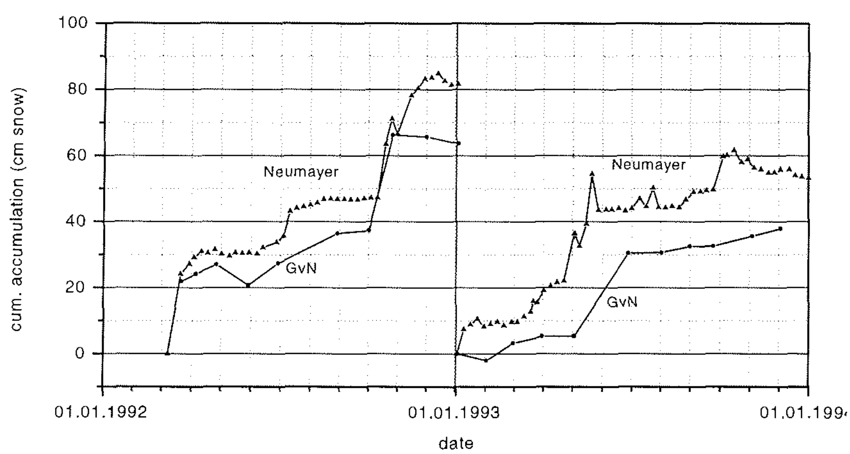

Fig. 4.1: Accumulation at Neumayer Station and Georg-von-Neumayer Station

The shape of the GvN curve is fairly similar to the Neumayer curve, but at the new array accumulation is distinctly higher than at the old one. This is a bit surprising, because the shorter distance to the coast and the fact, that Neumayer lies farther southward than GvN, would favour a lower accumulation at Neumayer compared to GvN. There are several possible explanations for the higher accumulation at Neumayer:

1. Usually accumulation in the immediate vicinity of the station is considerably higher than in a certain distance, because the building represents an obstacle for the wind. The newly constructed base Neumayer was about 10 m higher than the surrounding snow surface and might have influenced the accumulation even in a distance of 1 km. This would be confirmed by the observations of Roots and

Swithinbank (1955) at Maudheim, who investigated the influence of the station buildings on the accumulation by doing a levelling survey. They found that the approximately 4 m high sastrugi around the station caused a disturbance reaching to a distance of about 400 m.
2. Neumayer is situated about 5 km west of an ice rise, the Rüssel-Eishöcker. Since the predominating wind direction is east, a lee effect might have caused the comparatively high accumulation at Neumayer. Again already Swithinbank (1957) found at Quarisen that „a surface slope, however slight, resulted in a departure from the value for accumulation which might otherwise have been found."
3. The wind blowing over GvN comes directly from Atka Bay (see Fig. 3.1), where part of the snow, no matter whether drifting snow or real precipitation, is „trapped". In summer it falls into the open water, this concerns not more than two to three months of the year. But even if the Atka Bay is covered with ice, large cornices are built up on the sea ice at the ice shelf edge, which is about 10 m high. The snow stored in these cornices is removed from the possible accumulation at GvN.
On the contrary, Neumayer lies west of the southern edge of Atka Bay, it is still influenced by it, but the involved area of the bay is smaller. On the other hand, the ice edge is here higher than east of GvN, which would mean that more snow could be deposited on the sea ice at this edge.
The accumulation at the ice shelf edge east of GvN is extremely low, during most of the year blue ice is observed. The ice edge east of Neumayer is heavily crevassed due to the ice rise. Therefore in this area no accumulation measurements are available.
It is extremely difficult to estimate the order of magnitude of these different effects described above.
Unfortunately, only these twenty months of parallel measurements for the two sites are available. But during the summer of 1989/90 (which means, *before* Neumayer was built) a shallow firn core was taken at the planned construction site for the new station. The data from this core should enable us to eliminate at least the possible influence of the station.
Fig. 4.2 shows the accumulation rates derived from this firn core compared to the values obtained using the GvN stake measurements. At both sites the annual variability of the accumulation is relatively high.
Except for the first two years (1981 and 1982) the stake measurements agree well with the core data, Neumayer seems to have slightly lower accumulation rates than GvN, which would correspond to the expectation we had before we saw the results of the parallel measurements. In 1981 the core data yield an accumulation rate 180 mm higher than the stake data, whereas in the following year the stake data from GvN give an accumulation rate about 130 mm higher than the core data from Neumayer.
There are several possible error sources:
1. The dating of the core might be not always correct.
In Fig. 4.3 the ^{18}O-, conductivity, and density profiles of the „pre-Neumayer" core are shown. It can be seen that there is not always a distinctive maximum or minimum which can be clearly related to a certain summer or winter layer, respectively. It is also not possible to relate such a layer exactly to a certain month. A dating error is

likely to explain the large differences in 1981 and 1982.

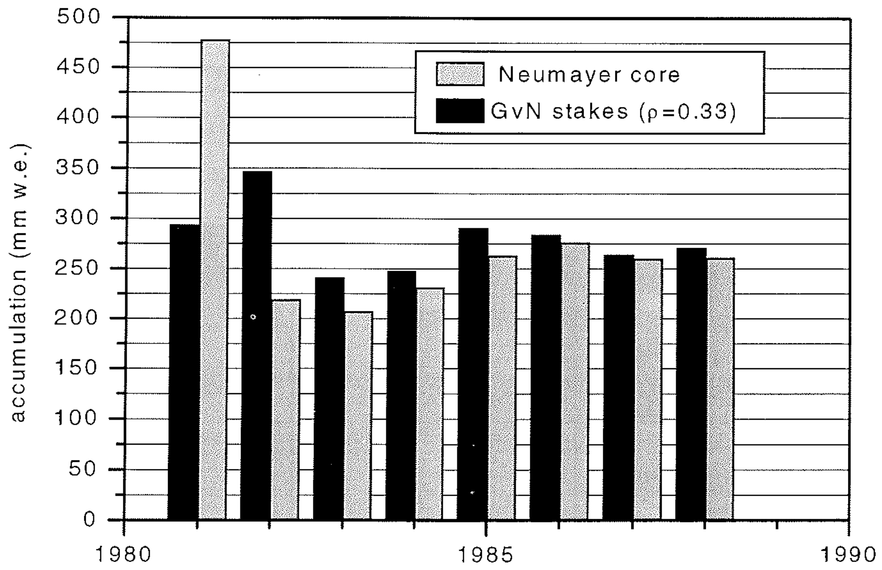

Fig. 4.2: Accumulation from GvN stake array and Neumayer core

2. To calculate the accumulation rate using the stake measurements, an assumption for the snow density has to be made. The density depends on wind speed, temperature, duration of the snowfall/drift, and amount of accumulation during this event. If the readings of the stake were not done immediately after the snowfall/drift, density may also slightly change due to settling of the snow. It is impossible to take all these factors into account.

Unfortunately, there are no density measurements of freshly fallen surface snow in the vicinity of GvN/Neumayer available. During the Norwegian-British-Swedish Antarctic Expedition a few surface snow samples of Quarisen were investigated, densities between 0.26 and 0.44 g/cm^3 were found (Swithinbank, 1957).

The density observed in the uppermost 10 to 20 cm of the snow pits varies between 0.30 and 0.46 g/cm^3. Usually the highest values are found in pits dug in summer after a longer clear weather period, when the snow had had time to settle. In winter and immediately after a snowfall/drift event the density is lower. Usually, heavy accumulation means less windpacked snow, which was already observed at Maudheim (Swithinbank, 1957). Therefore for the calculation of the accumulation rate a density of 0.33 g/cm^3 was assumed, a value, which is also often found in the literatur (e.g. Hoinkes, 1962).

The time period taken as one year in the core might be different from the period for which the yearly accumulation was calculated using the stakes. At least the

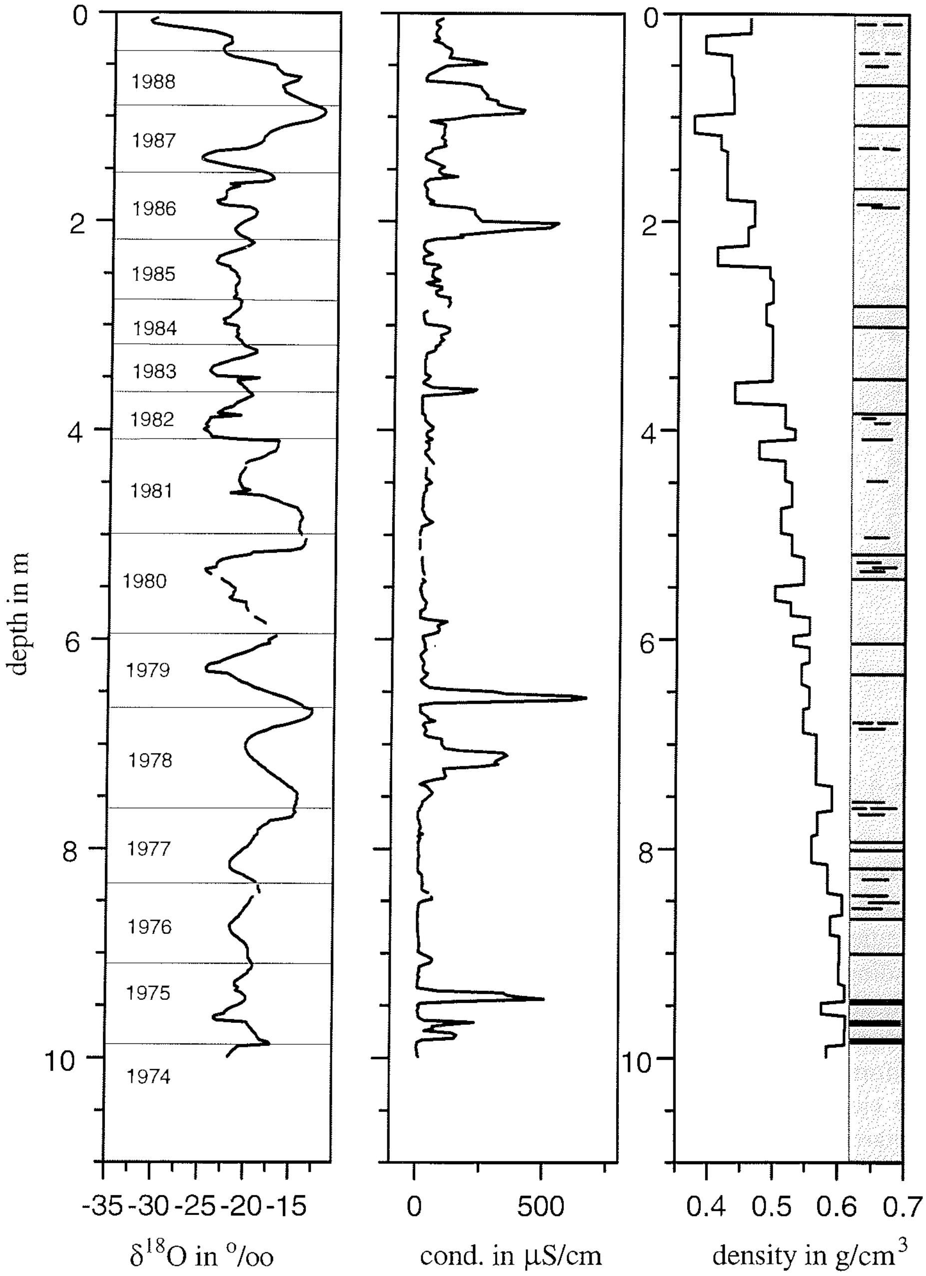

Fig. 4.3: Shallow firn core FB0189, Neumayer, December 1989 (Construction site)

cumulative or the mean accumulation over the whole period which is covered by the core should equal the accumulation at the stake array, but again the problem with the dating of the lowest part of the core occurs. For the years 1981 - 1988, for

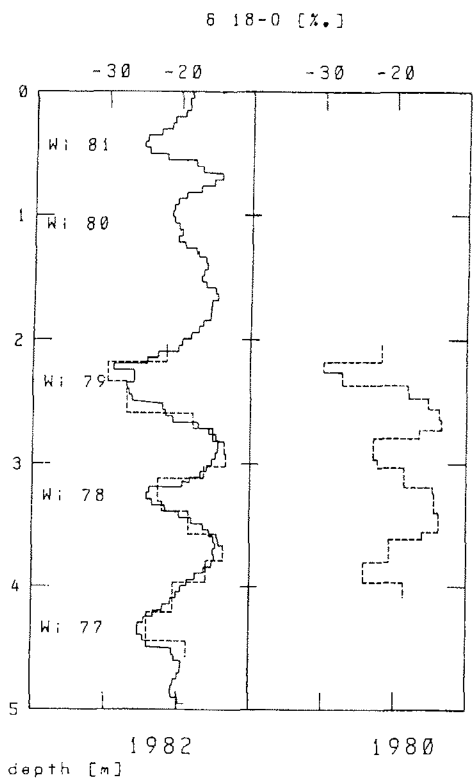

Fig. 4.4: Comparison of pit (1980) to core (1982) at GvN
(from Reinwarth et al., 1985)

which both core and stake data are available, the core data yield a mean accumulation rate of 274 mm/yr, the stake data (assuming a density of 0.33 g/cm^3) 270 mm/yr. This means, the agreement between the GvN stake measurements and the Neumayer core measurements is very good considering the uncertainties of both measurements. (Obviously, the quality of the agreement depends mainly on the assumption for the density. The accumulation rate at GvN might be even slightly higher than at Neumayer, since the assumption for the snow density was at the lower limit.) This leeds to the conclusion that the higher values observed at the stake array Neumayer after the construction of the new base must be due to the influence of the station itself. This influence should have been damped out after a few years, since the station was close to the level of the surrounding surface already after three years, and the largest sastrugi are built up to the west of the building, whereas the area of the stake array, 1km south of the base, should be influenced only very weakly.

The stake measurements at GvN and at Neumayer are generally well correlated, we can thus consider the series of stake measurements as homogeneous, except for the few years immediately after the new base was built. But it should be kept in mind, especially when looking at the temporal accumulation distribution later on, that the accumulation rates at the new base might be generally slightly lower than at GvN.

4.2 Direct comparison of snow pits and cores

Unfortunately, samples from snow pits dug at the same time and the same site where cores were taken are rare. Sometimes cores were taken from the bottom of snow pits, but really parallel measurements of core and pit samples are available only for two cases, in April 1987 at GvN, and in December 1989 at the construction site for Neumayer. These measurements can only give a hint to the quality of the measurements and/or the spatial homogeneity of the snow pack, since no isotope analysis were carried out, we only have a few conductivity and density measurements. The density values in snow pit and core differ between 0.00 and 0.06g/cm^3, the measurements of the electrolytical conductivity also agree fairly well. A better possibility for a comparison is provided by a snow pit dug in 1980 and a firn core taken in 1982 at GvN. Fig. 4.4 shows the ^{18}O content in the snow pit and in the uppermost part on the ice core. The depth axes of the 1980 curve (right) has been deformed to take into account the compaction of the snow pack due to settling, and the ^{18}O profile has been superimposed on the 1980 profile (left) (Fig. 6 from Reinwarth et al., 1985). Both curves agree surprisingly well.

4.3 Comparison of stake measurements to snow pits

In order to get a feeling for the accuracy of the snow pits they are compared to the stake measurements. Tab. 4.1 shows accumulation values derived from several snow pits and from the stake array for the same time periods. The dating of these snow pits was done using mainly the snow stratigraphy. As mentioned in Chapter 4.1 an assumption for snow density has to be made for the calculation of water equivalent of accumulation at the stake array. Generally, the agreement between stake and pit measurements is satisfactory using density values between 0.33 g/cm^3 and 0.4 g/cm^3. Since surface snow density measurements are lacking, it is not possible to determine the accumulation at the stake array more exactly.
However, the stake measurements are very helpful when doubts in dating of pits occur, and the combination of pit and stake measurements gives reliable values for the accumulation rates.

Tab.4.1: Comparison of stake measurements and snow pits

time period	acc. at stake array (mm w.e.)	acc. in snow pit (mm w.e.)	remarks
18.3.81-19.2.82	335 (ρ=0.33 g/cm^3)	320	
1.3.85-28.4.87	757 (ρ=0.40 g/cm^3)	818	
1.3.86- 6.2.88	705 (ρ=0.40 g/cm^3)	710	
14.3.87- 6.5.87	105 (ρ=0.33 g/cm^3)	103	15km South
1.3.88- 14.2.91	686 (ρ=0.33 g/cm^3)	593	

4.4 Comparison of cores and stake measurements

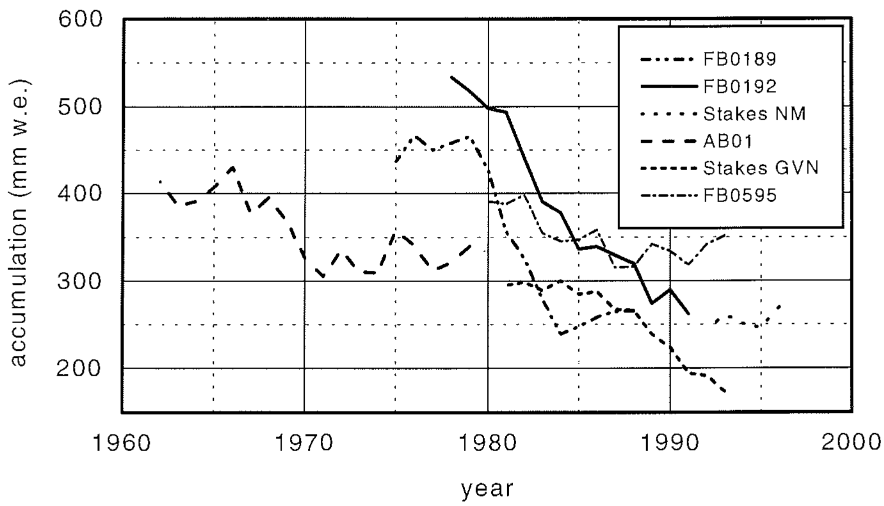

Fig. 4.5: Accumulation rates (5-year running means) derived from four different cores and from stake measurements at GvN and Neumayer, respectively

The cores so far available cover the time period 1962 - 1996. However, there is no single core covering the whole period. The longest core gives information about 18 years.

Fig. 4.5 shows the accumulation rates derived from four different cores and from the stake arrays at GvN and Neumayer, respectively. The agreement between the curves is by no means satisfactory. This shows that it is impossible to determine the accumulation rate from a single core or for a single year. Dating problems and inhomogeneities in the snow pack can lead to considerable errors. The agreement should be better, if we calculate the mean value for comparable periods of several cores, which is done in Tab. 4.2.

Tab. 4.2: Mean accumulation rates (mm w.e./a) derived from different cores for comparable time periods

core / period	AB01	fbgvn 0282	E002	fb0189	fb0192	fb0595	Stakes GvN
1978-88	-	-	-	330	413		-
1981-88	-	-	-	274	368	352	290/351 ρ=0.33/0.40
1971-81	-	362	348	-	-		-
1967-79	339	363	-	-	-		-
1975-79	312	379	379	450	-		-

As expected, the agreement between different cores is much better here. But it should be emphasized, that in an area like Ekströmisen, where wind influence is strong and dating using isotope stratigraphy can be uncertain, long-term and repeated measurements are necessary to get reliable results.

5. TEMPORAL VARIATIONS AND SPATIAL DISTRIBUTION OF ACCUMULATION

5.1 Spatial distribution of accumulation

In Chapter 4 we already compared the accumulation rates of GvN and Neumayer, which, lying about 7 km apart, are quite similar. Now we want to extend our investigation to larger distances from the base.
Between GvN and the ice edge no long term accumulation measurements exist, but during the first years some stake measurements were carried out. Towards the coast the accumulation decreases considerably, on the last 1-2 km ablation due to wind erosion is observed.
In 1987/88 the three stake arrays N, W, and 15km S were run, only the measurements at 15km S have been continued until today. Fig. 5.1 shows the accumulation measured at the different stake arrays during the overwintering year 1987. To avoid problems with density assumptions the accumulation in cm snow is plotted here.

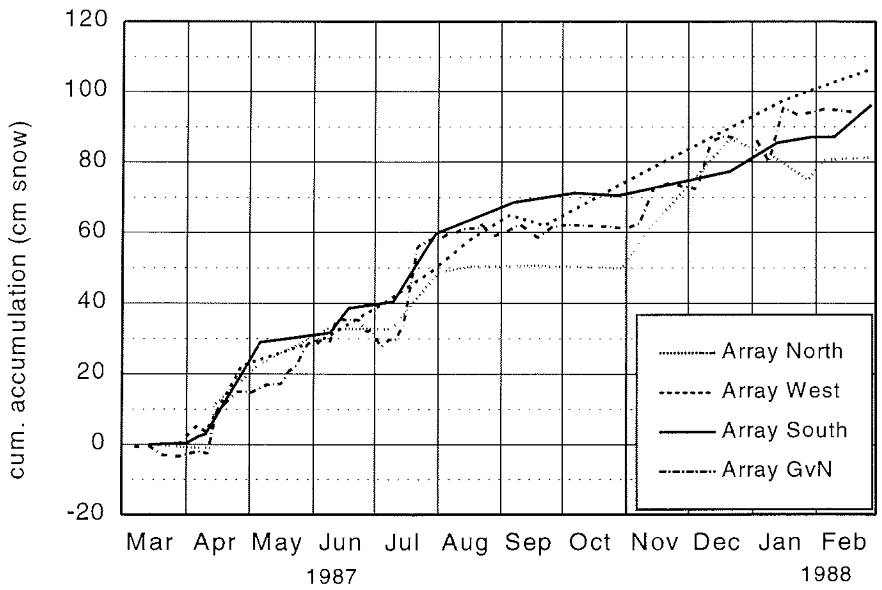

Fig. 5.1: Cumulative accumulation at stake arrays North, West, South and GvN (Sturm, pers. comm.)

Generally, the curves are quite similar, the one from GvN is not as smooth as the other three, because the stakes were measured more frequently here. The stake array

North seems to have the smallest accumulation rate (probably due to the proximity of the coast), but it is dangerous to draw conclusions from only one year of measurements. Thus we can only say, that there are no remarkable differences between these four stake arrays.
During the Ekström Traverse a N-S-profile of accumulation along Ekströmisen was measured. Fig. 5.2 shows the accumulation rates derived from snow pits and shallow firn cores between Neumayer and the grounding line (see also Reinwarth and Moser, 1990).

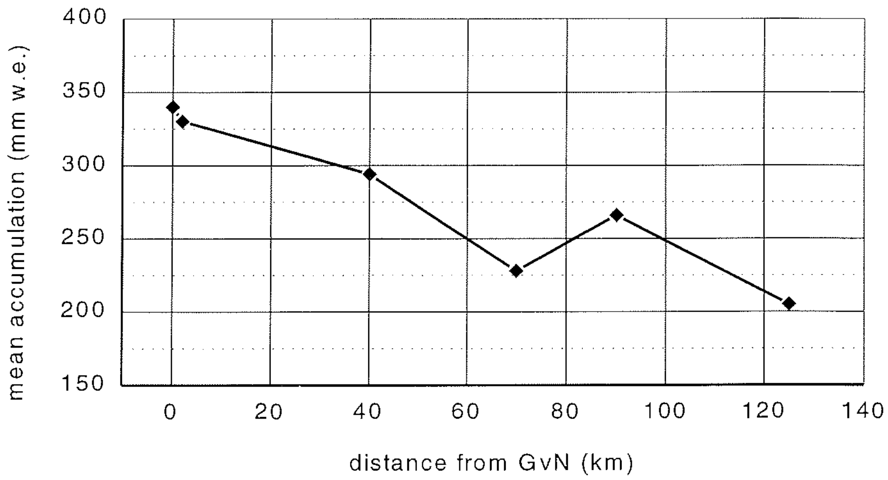

Fig. 5.2: Accumulation rates along the Ekström-Traverse (after Reinwarth et al., 1990)

The accumulation rates decrease towards the South, probably due to increasing continentality of the climate, only the core at km 90 yields a relatively high accumulation. It is not possible to explain this high value topographically. But since according to Reinwarth and Moser (1990) the accuracy of the measurement is not better than $\pm$ 60 mm w.e. and besides stake measurements show, that the spatial variability of accumulation ist extremely high in this area, we can say that a general decrease of accumulation between GvN and the grounding line is found.
For the sake of completeness, also the accumulation at Halvfarryggen and Søråsen should be mentioned here, although they do not belong to the ice shelf itself.
At Søråsen the mean accumulation rate is 208 cm snow/a, which is surprisingly high compared to Halvfarryggen, where less than 30% of this value (1990-96: 56cm snow/a) is reached. The Olymp station lies not exactly on top of Søråsen, but on the northeastern slope in a slight depression, which is not recognizable for the unaided eye. But measurements along a line from below the station to the top have shown, that the geophysicists set up their station exactly in an area with a local maximum

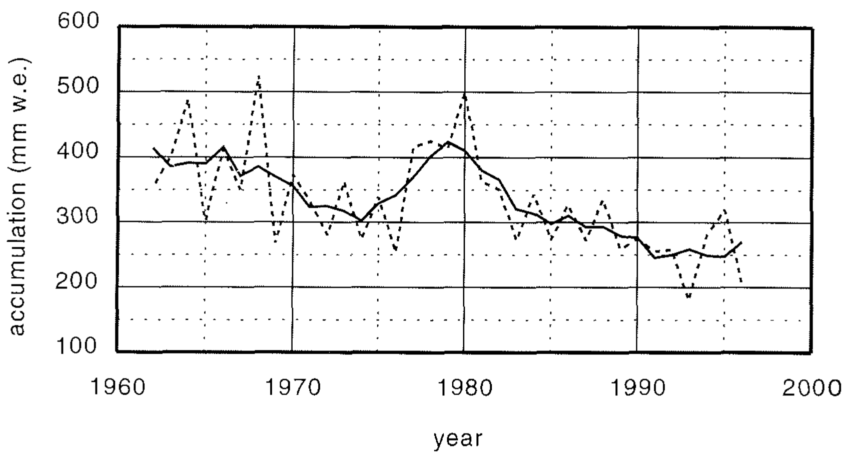

Fig. 5.3: Mean and 5-year-running mean of accumulation rates derived from stake measurements and five different cores (cf. Fig. 4.5, + E002) taken at GvN and Neumayer

of accumulation.
Watzmann station on Halvfarryggen is probably more representative for the accumulation on the ridges surrounding Ekströmisen.

5.2 Temporal variations of accumulation

Fig. 5.3 shows the mean and 5-year running mean of the accumulation rate derived from stake measurements and five different cores taken at GvN and Neumayer.
The most striking feature is, that since the late 1970s the accumulation has been decreasing continuously. This is surprising, since from most other parts of Antarctica increasing accumulation rates are reported. According to Peel (1992) ice core data from the Antarctic Peninsula yield an increase in accumulation since 1950 (see also Peel and Mulvaney, 1988). The Peninsula represents an area, which is sensitive to environmental change and should be one of the first places to give an indication of trends possibly influencing the rest of the Antarctic ice sheet (Doake, 1982).
However, also in Wilkes Land, East Antarctica, accumulation rates have been increasing since about 1960 (Morgan et al. 1991).
Isaksson and others (1996) are the only who also found decreasing accumulation rates during the SWEDARP expedition at Riiser-Larsen Ice Shelf and Ritscherflya, southeast of the area investigated in this study. Fig. 5.4 shows the 7-year-running mean of accumulation derived from a core at Ritscherflya at 73°36'S / 12°26'W (Isaksson and Karlen, 1994). Like at Neumayer, the relatively strong decrease in accumulation since about 1976 is striking. Six other cores from Riiser-Larsen Ice Shelf und Ritscherflya show similar results.

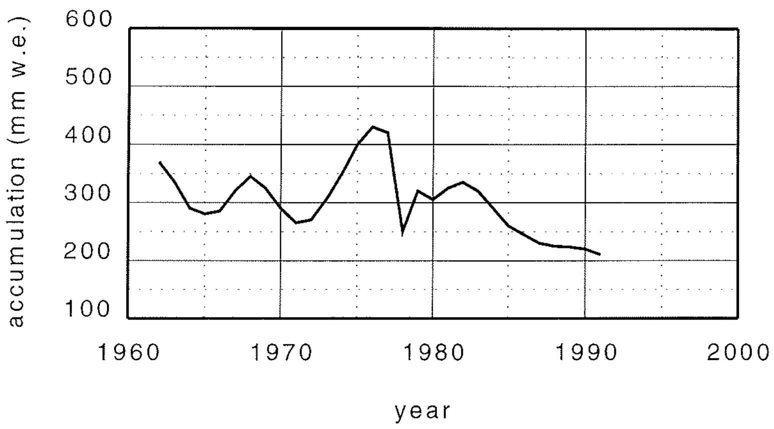

Fig. 5.4: 7-year running mean of accumulation rate derived from a core at Ritscherflya (after Isaksson, 1994)

This means that increasing accumulation rates, which are commonly connected to climatic warming, have not been a general Antarctic-wide phenomenon during the last decades.

6. CONCLUSION

Since the austral summer 1979/1980 accumulation studies have been carried out at Ekströmisen, Dronning Maud Land, where the German overwintering station „Neumayer" is situated. Continuous stake measurements are accompanied by snow pit studies and drilling of shallow firn cores in the vicinity of the base, at two geophysical stations on the hills surrounding the ice shelf, and along a traverse down to the grounding line. Visual stratigraphy, measurements of isotopes (^{18}O, ^{2}H, ^{3}H), and electrolytical conductivity were used for dating of the cores and thus determination of accumulation rates.

The mean accumulation rate from 1981-1996 derived from stake measurements, snow pits, and firn cores at Neumayer is 287 mm w.e./a.

A gradual decrease of accumulation towards the grounding line is observed, as well as a decrease towards the coast, immediately at the ice shelf edge even net ablation due to wind erosion is found.

The spatial and temporal variability of accumulation is fairly high, nevertheless a decrease in accumulation rates has been observed during the last 20 years. This is contradictory to observations in many other parts of Antarctica, where increasing accumulation rates are found.

Swedish studies at Riiser-Larsen Ice Shelf and Rytscherflya (about 300 km southeast of Ekströmisen) also yielded decreasing accumulation, which confirms our results. Increasing accumulation rates, which are commonly connected to climatic warming, are thus not an Antarctic-wide phenomenon.

However, accumulation is only one part of the mass balance, namely that part, which reacts first to a possible climate change. It is beyond the scope of this study to relate the observed decrease in accumulation to meteorological data.

To decide whether the small drainage basin Ekströmisen belongs to is in balance with the present climate, further studies are needed, especially more mass balance studies on the grounded ice (Ritscherflya, Maudheimvidda) including ice flow investigations, as well as measurements of ice shelf melting at the bottom and the front. First measurements of bottom melting have been carried out by Nixdorf (Nixdorf et al., 1994, Lambrecht et al., 1995). More information about mass balance on the ice sheet will come from the ice cores taken during the EPICA pre-site survey expeditions.

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Numerous people contributed to this work in many different ways. In Appendix E all people involved in sampling and analyzing of the data are listed.
We are grateful to Klaus Sturm, who made his unpublished data from the overwintering year 1987/88 available to us.
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APPENDIX A

Accumulation stake measurements

Georg-von-Neumayer-Station (70°37'S 8°22'W)

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
	18.03.1981	0.0	0	0
18.03.1981	22.03.1981	2.1	2.1	2.1
22.03.1981	23.03.1981	-0.7	1.4	1.4
23.03.1981	31.03.1981	2.7	4.1	4.1
31.03.1981	06.04.1981	26.9	31.0	31.0
06.04.1981	12.04.1981	13.0	44.0	44.0
12.04.1981	17.04.1981	0.3	44.3	44.3
17.04.1981	28.04.1981	-4.7	39.6	39.6
28.04.1981	06.05.1981	1.5	41.1	41.1
06.05.1981	14.05.1981	-3.2	37.9	37.9
14.05.1981	30.05.1981	-0.5	37.4	37.4
30.05.1981	08.06.1981	6.8	44.2	44.2
08.06.1981	12.06.1981	-0.7	43.5	43.5
12.06.1981	17.06.1981	-0.1	43.4	43.4
17.06.1981	29.06.1981	0.3	43.7	43.7
29.06.1981	11.07.1981	0.9	44.6	44.6
11.07.1981	30.07.1981	5.7	50.3	50.3
30.07.1981	13.08.1981	-0.7	49.6	49.6
13.08.1981	19.08.1981	0.0	49.6	49.6
19.08.1981	22.08.1981	0.3	49.9	49.9
22.08.1981	31.08.1981	0.1	50.0	50.0
31.08.1981	06.09.1981	0.5	50.5	50.5
06.09.1981	09.09.1981	0.2	50.7	50.7
09.09.1981	20.09.1981	2.1	52.8	52.8
20.09.1981	01.10.1981	-1.1	51.7	51.7
01.10.1981	10.10.1981	10.5	62.2	62.2
10.10.1981	14.10.1981	-0.3	61.9	61.9
14.10.1981	19.10.1981	-2.4	59.5	59.5
19.10.1981	30.10.1981	-0.5	59.0	59.0
30.10.1981	12.11.1981	16.6	75.6	75.6
12.11.1981	26.11.1981	1.1	76.7	76.7
26.11.1981	06.12.1981	2.9	79.6	79.6
				0.0
06.12.1982	07.01.1982	9.9	89.5	9.9
07.01.1982	26.01.1982	-0.6	88.9	9.3
26.01.1982	29.01.1982	3.0	91.9	12.3
29.01.1982	19.02.1982	9.7	101.6	22.0
19.02.1982	25.02.1982	2.0	103.6	24.0
25.02.1982	28.02.1982	0.1	103.7	24.1
28.02.1982	01.03.1982	-0.9	102.8	23.2
01.03.1982	04.03.1982	1.3	104.1	24.5
04.03.1982	07.03.1982	-0.2	103.9	24.3
07.03.1982	09.03.1982	-0.5	103.4	23.8
09.03.1982	17.03.1982	5.3	108.7	29.1
17.03.1982	19.03.1982	-2.9	105.8	26.2
19.03.1982	21.03.1982	-1.8	104.0	24.4
21.03.1982	27.03.1982	12.6	116.6	37.0
27.03.1982	30.03.1982	1.0	117.6	38.0
30.03.1982	31.03.1982	4.0	121.6	42.0
31.03.1982	04.04.1982	-4.2	117.4	37.8
04.04.1982	11.04.1982	16.3	133.7	54.1
11.04.1982	20.04.1982	-5.1	128.6	49.0
20.04.1982	25.04.1982	-0.4	128.2	48.6
25.04.1982	30.04.1982	7.3	135.5	55.9
30.04.1982	09.05.1982	1.1	136.6	57.0
09.05.1982	21.05.1982	-1.0	135.6	56.0
21.05.1982	29.05.1982	-0.9	134.7	55.1
29.05.1982	03.06.1982	-0.8	133.9	54.3
03.06.1982	20.06.1982	3.8	137.7	58.1
20.06.1982	22.06.1982	-1.7	136.0	56.4
22.06.1982	27.06.1982	0.2	136.2	56.6
27.06.1982	30.06.1982	0.2	136.4	56.8

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
30.06.1982	01.07.1982	0.6	137.0	57.4
01.07.1982	04.07.1982	-1.9	135.1	55.5
04.07.1982	07.07.1982	0.0	135.1	55.5
07.07.1982	10.07.1982	2.4	137.5	57.9
10.07.1982	12.07.1982	0.2	137.7	58.1
12.07.1982	14.07.1982	-1.1	136.6	57.0
14.07.1982	17.07.1982	0.9	137.5	57.9
17.07.1982	19.07.1982	-0.5	137.0	57.4
19.07.1982	24.07.1982	-0.4	136.6	57.0
24.07.1982	29.07.1982	2.5	139.1	59.5
29.07.1982	03.08.1982	3.8	142.9	63.3
03.08.1982	05.08.1982	0.1	143.0	63.4
05.08.1982	06.08.1982	0.0	143.0	63.4
06.08.1982	09.08.1982	1.5	144.5	64.9
09.08.1982	16.08.1982	0.5	145.0	65.4
16.08.1982	18.08.1982	0.0	145.0	65.4
18.08.1982	21.08.1982	0.8	145.8	66.2
21.08.1982	26.08.1982	-4.8	141.0	61.4
26.08.1982	30.08.1982	2.8	143.8	64.2
30.08.1982	04.09.1982	10.1	153.9	74.3
04.09.1982	10.09.1982	0.1	154.0	74.4
10.09.1982	15.09.1982	1.4	155.4	75.8
15.09.1982	18.09.1982	12.3	167.7	88.1
18.09.1982	27.08.1982	-0.3	167.4	87.8
27.08.1982	02.10.1982	-0.2	167.2	87.6
02.10.1982	09.10.1982	12.1	179.3	99.7
09.10.1982	13.10.1982	-2.3	177.0	97.4
13.10.1982	15.10.1982	0.2	177.2	97.6
15.10.1982	17.10.1982	15.7	192.9	113.3
17.10.1982	19.10.1982	-4.9	188.0	108.4
19.10.1982	23.10.1982	1.4	189.4	109.8
23.10.1982	27.10.1982	1.7	191.1	111.5
27.10.1982	10.11.1982	7.6	198.7	119.1
10.11.1982	17.11.1982	-3.2	195.5	115.9
17.11.1982	28.11.1982	-1.1	194.4	114.8
28.11.1982	11.12.1982	-0.6	193.8	114.2
11.12.1982	14.12.1982	0.3	194.1	114.5
14.12.1982	21.12.1982	-2.5	191.6	112.0
21.12.1982	22.12.1982	-1.3	190.3	110.7
22.12.1982	25.12.1982	-0.3	190.0	110.4
25.12.1982	28.12.1982	0.9	190.9	111.3
				0.0
28.12.1982	06.01.1983	-2.1	188.8	-2.1
06.01.1983	15.01.1983	0.2	189.0	-1.9
15.01.1983	17.01.1983	0.0	189.0	-1.9
17.01.1983	22.01.1983	1.4	190.4	-0.5
22.01.1983	25.01.1983	0.3	190.7	-0.2
25.01.1983	27.01.1983	0.0	190.7	-0.2
27.01.1983	16.03.1983	0.0	190.7	-0.2
16.03.1983	12.04.1983	23	213.7	22.8
12.04.1983	18.05.1983	0.0	213.7	22.8
18.05.1983	13.06.1983	0.0	213.7	22.8
13.06.1983	12.07.1983	0.0	213.7	22.8
12.07.1983	16.07.1983	28.0	241.7	50.8
16.07.1983	20.08.1983	16.0	257.7	66.8
20.08.1983	02.09.1983	0.0	257.7	66.8
02.09.1983	15.09.1983	0.0	257.7	66.8
15.09.1983	18.09.1983	0.0	257.7	66.8
18.09.1983	04.10.1983	18.0	275.7	84.8
04.10.1983	14.10.1983	-16.0	259.7	68.8
14.10.1983	24.10.1983	3.0	262.7	71.8
24.10.1983	17.11.1983	-3.0	259.7	68.8
17.11.1983	25.11.1983	0.0	259.7	68.8
25.11.1983	09.12.1983	8.0	267.7	76.8
				0.0
09.12.1984	10.01.1984	-2.0	265.7	-2.0

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
10.01.1984	19.01.1984	27.0	292.7	25.0
19.01.1984	01.02.1984	-5.0	287.7	20.0
01.02.1984	03.02.1984	0.0	287.7	20.0
03.02.1984	10.02.1984	-0.1	287.6	19.9
10.02.1984	13.02.1984	0.7	288.3	20.6
13.02.1984	17.02.1984	0.2	288.5	20.8
17.02.1984	21.02.1984	0.9	289.4	21.7
21.02.1984	15.03.1984	4.2	293.6	25.9
15.03.1984	18.03.1984	0.1	293.7	26.0
18.03.1984	26.03.1984	-1.2	292.5	24.8
26.03.1984	29.03.1984	8.5	301.0	33.3
29.03.1984	01.04.1984	-1.9	299.1	31.4
01.04.1984	09.04.1984	0.3	299.4	31.7
09.04.1984	23.04.1984	-4.0	295.4	27.7
23.04.1984	02.05.1984	5.4	300.8	33.1
02.05.1984	05.05.1984	3.9	304.7	37.0
05.05.1984	11.05.1984	0.9	305.6	37.9
11.05.1984	19.05.1984	0.2	305.8	38.1
19.05.1984	26.05.1984	4.7	310.5	42.8
26.05.1984	03.06.1984	-5.6	304.9	37.2
03.06.1984	15.06.1984	3.1	308.0	40.3
15.06.1984	18.06.1984	1.6	309.6	41.9
18.06.1984	25.06.1984	1.2	310.8	43.1
25.06.1984	02.07.1984	4.6	315.4	47.7
02.07.1984	06.07.1984	1.8	317.2	49.5
06.07.1984	09.07.1984	0.2	317.4	49.7
09.07.1984	12.07.1984	2.6	320.0	52.3
12.07.1984	20.07.1984	-2.5	317.5	49.8
20.07.1984	26.07.1984	2.6	320.1	52.4
26.07.1984	30.07.1984	5.8	325.9	58.2
30.07.1984	04.08.1984	2.6	328.5	60.8
04.08.1984	07.08.1984	-2.3	326.2	58.5
07.08.1984	13.08.1984	-0.2	326.0	58.3
13.08.1984	19.08.1984	0.0	326.0	58.3
19.08.1984	23.08.1984	7.4	333.4	65.7
23.08.1984	28.08.1984	-1.9	331.5	63.8
28.08.1984	30.08.1984	-3.2	328.3	60.6
30.08.1984	02.09.1984	5.4	333.7	66.0
02.09.1984	07.09.1984	-3.4	330.3	62.6
07.09.1984	09.09.1984	0.8	331.1	63.4
09.09.1984	14.09.1984	0.1	331.2	63.5
14.09.1984	17.09.1984	1.1	332.3	64.6
17.09.1984	22.09.1984	-0.6	331.7	64.0
22.09.1984	27.09.1984	1.5	333.2	65.5
27.09.1984	29.09.1984	-1.3	331.9	64.2
29.09.1984	06.10.1984	10.2	342.1	74.4
06.10.1984	13.10.1984	-6.6	335.5	67.8
13.10.1984	15.10.1984	15.1	350.6	82.9
15.10.1984	20.10.1984	-1.2	349.4	81.7
20.10.1984	22.10.1984	-1.9	347.5	79.8
22.10.1984	24.10.1984	0.0	347.5	79.8
24.10.1984	28.10.1984	-0.2	347.3	79.6
28.10.1984	31.10.1984	1.6	348.9	81.2
31.10.1984	03.11.1984	1.3	350.2	82.5
03.11.1984	09.11.1984	5.1	355.3	87.6
09.11.1984	12.11.1984	1.4	356.7	89.0
12.11.1984	17.11.1984	20.7	377.4	109.7
17.11.1984	21.11.1984	-4.2	373.2	105.5
21.11.1984	24.11.1984	-0.4	372.8	105.1
24.11.1984	30.11.1984	-1.9	370.9	103.2
30.11.1984	09.12.1984	-2.7	368.2	100.5
09.12.1984	11.12.1984	-0.4	367.8	100.1
11.12.1984	15.12.1984	-0.5	367.3	99.6
15.12.1984	22.12.1984	-1.8	365.5	97.8
22.12.1984	29.12.1984	-3.5	362.0	94.3
				0.0

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
29.12.1984	09.01.1985	-0.1	361.9	-0.1
09.01.1985	13.01.1985	-0.5	361.4	-0.6
13.01.1985	29.01.1985	1.5	362.9	0.9
29.01.1985	01.02.1985	-2.0	360.9	-1.1
01.02.1985	09.02.1985	1.4	362.3	0.3
09.02.1985	17.02.1985	1.3	363.6	1.6
17.02.1985	20.02.1985	-1.6	362.0	0.0
20.02.1985	07.03.1985	14.7	376.7	14.7
07.03.1985	22.03.1985	-1.6	375.1	13.1
22.03.1985	01.04.1985	13.6	388.7	26.7
01.04.1985	04.04.1985	0.0	388.7	26.7
04.04.1985	13.04.1985	0.0	388.7	26.7
13.04.1985	21.04.1985	2.5	391.2	29.2
21.04.1985	28.04.1985	-0.4	390.8	28.8
28.04.1985	11.05.1985	3.0	393.8	31.8
11.05.1985	18.05.1985	3.5	397.3	35.3
18.05.1985	26.05.1985	-5.7	391.6	29.6
26.05.1985	02.06.1985	-1.2	390.4	28.4
02.06.1985	08.06.1985	-0.3	390.1	28.1
08.06.1985	16.06.1985	0.7	390.8	28.8
16.06.1985	01.07.1985	6.2	397.0	35.0
01.07.1985	09.07.1985	-4.1	392.9	30.9
09.07.1985	23.07.1985	0.1	393.0	31.0
23.07.1985	31.07.1985	-0.3	392.7	30.7
31.07.1985	11.08.1985	2.2	394.9	32.9
11.08.1985	01.09.1985	-1.2	393.7	31.7
01.09.1985	14.09.1985	-0.5	393.2	31.2
14.09.1985	29.09.1985	24.4	417.6	55.6
29.09.1985	05.10.1985	3.2	420.8	58.8
05.10.1985	12.10.1985	-0.4	420.4	58.4
12.10.1985	19.10.1985	1.6	422.0	60.0
19.10.1985	26.10.1985	0.3	422.3	60.3
26.10.1985	02.11.1985	5.7	428.0	66.0
02.11.1985	09.11.1985	-0.2	427.8	65.8
09.11.1985	17.11.1985	6.5	434.3	72.3
17.11.1985	27.11.1985	-2.9	431.4	69.4
27.11.1985	02.12.1985	0.9	432.3	70.3
02.12.1985	21.12.1985	5.6	437.9	75.9
				0.0
21.12.1985	04.01.1986	14.4	452.3	14.4
04.01.1986	11.01.1986	0.5	452.8	14.9
11.01.1986	18.01.1986	-0.3	452.5	14.6
18.01.1986	25.01.1986	2.9	455.4	17.5
25.01.1986	01.02.1986	-2.4	453.0	15.1
01.02.1986	08.02.1986	0.1	453.1	15.2
08.02.1986	15.02.1986	0.2	453.3	15.4
15.02.1986	22.02.1986	1.7	455.0	17.1
22.02.1986	01.03.1986	0.4	455.4	17.5
01.03.1986	08.03.1986	0.8	456.2	18.3
08.03.1986	15.03.1986	0.2	456.4	18.5
15.03.1986	22.03.1986	1.6	458.0	20.1
22.03.1986	29.03.1986	2.7	460.7	22.8
29.03.1986	05.04.1986	17.4	478.1	40.2
05.04.1986	12.04.1986	-4.8	473.3	35.4
12.04.1986	19.04.1986	-2.4	470.9	33.0
19.04.1986	26.04.1986	0.5	471.4	33.5
26.04.1986	03.05.1986	-1.0	470.4	32.5
03.05.1986	10.05.1986	3.3	473.7	35.8
10.05.1986	17.05.1986	-0.4	473.3	35.4
17.05.1986	24.05.1986	-0.4	472.9	35.0
24.05.1986	31.05.1986	23.7	496.6	58.7
31.05.1986	07.06.1986	-1.1	495.5	57.6
07.06.1986	14.06.1986	4.7	500.2	62.3
14.06.1986	21.06.1986	1.6	501.8	63.9
21.06.1986	28.06.1986	0.3	502.1	64.2
28.06.1986	05.07.1986	-1.6	500.5	62.6

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
05.07.1986	12.07.1986	-0.2	500.3	62.4
12.07.1986	19.07.1986	2.9	503.2	65.3
19.07.1986	26.07.1986	-3.2	500.0	62.1
26.07.1986	02.08.1986	5.1	505.1	67.2
02.08.1986	09.08.1986	5.3	510.4	72.5
09.08.1986	19.08.1986	9.7	520.1	82.2
19.08.1986	23.08.1986	-13.5	506.6	68.7
23.08.1986	30.08.1986	17.7	524.3	86.4
30.08.1986	06.09.1986	8.9	533.2	95.3
06.09.1986	18.09.1986	-3.8	529.4	91.5
18.09.1986	20.09.1986	0.0	529.4	91.5
20.09.1986	27.09.1986	3.3	532.7	94.8
27.09.1986	06.10.1986	-2.0	530.7	92.8
06.10.1986	11.10.1986	6.0	536.7	98.8
11.10.1986	20.10.1986	0.3	537.0	99.1
20.10.1986	25.10.1986	-1.1	535.9	98.0
25.10.1986	01.11.1986	-2.7	533.2	95.3
01.11.1986	10.11.1986	4.3	537.5	99.6
10.11.1986	15.11.1986	-0.3	537.2	99.3
15.11.1986	22.11.1986	-1.5	535.7	97.8
22.11.1986	29.11.1986	1.3	537.0	99.1
29.11.1986	06.12.1986	-0.1	536.9	99.0
06.12.1986	14.12.1986	-1.2	535.7	97.8
14.12.1986	20.12.1986	-0.5	535.2	97.3
20.12.1986	27.12.1986	-0.3	534.9	97.0
				0.0
27.12.1986	03.01.1987	-2.1	532.8	-2.1
03.01.1987	04.01.1987	0.0	532.8	-2.1
04.01.1987	10.01.1987	4.4	537.2	2.3
10.01.1987	17.01.1987	-2.9	534.3	-0.6
17.01.1987	24.01.1987	0.5	534.8	-0.1
24.01.1987	31.01.1987	-0.7	534.1	-0.8
31.01.1987	07.02.1987	0.2	534.3	-0.6
07.02.1987	14.02.1987	4.2	538.5	3.6
14.02.1987	21.02.1987	-1.8	536.7	1.8
21.02.1987	28.02.1987	-0.5	536.2	1.3
28.02.1987	07.03.1987	-0.8	535.4	0.5
07.03.1987	14.03.1987	0.3	535.7	0.8
14.03.1987	21.03.1987	-2.6	533.1	-1.8
21.03.1987	28.03.1987	-0.3	532.8	-2.1
28.03.1987	06.04.1987	1.4	534.2	-0.7
06.04.1987	11.04.1987	-0.5	533.7	-1.2
11.04.1987	14.04.1987	8.7	542.4	7.5
14.04.1987	16.04.1987	4.8	547.2	12.3
16.04.1987	18.04.1987	-0.1	547.1	12.2
18.04.1987	25.04.1987	4.2	551.3	16.4
25.04.1987	02.05.1987	-0.3	551.0	16.1
02.05.1987	09.05.1987	2.2	553.2	18.3
09.05.1987	16.05.1987	0.1	553.3	18.4
16.05.1987	20.05.1987	3.8	557.1	22.2
20.05.1987	23.05.1987	1.1	558.2	23.3
23.05.1987	29.05.1987	6.6	564.8	29.9
29.05.1987	02.06.1987	-0.7	564.1	29.2
02.06.1987	04.06.1987	1.6	565.7	30.8
04.06.1987	06.06.1987	0.0	565.7	30.8
06.06.1987	09.06.1987	-0.5	565.2	30.3
09.06.1987	12.06.1987	6.5	571.7	36.8
12.06.1987	13.06.1987	0.1	571.8	36.9
13.06.1987	17.06.1987	-0.3	571.5	36.6
17.06.1987	20.06.1987	0.1	571.6	36.7
20.06.1987	23.06.1987	-0.1	571.5	36.6
23.06.1987	27.06.1987	-3.4	568.1	33.2
27.06.1987	29.06.1987	0.6	568.7	33.8
29.06.1987	04.07.1987	-4.8	563.9	29.0
04.07.1987	08.07.1987	2.0	565.9	31.0
08.07.1987	11.07.1987	-0.2	565.7	30.8

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
11.07.1987	15.07.1987	4.3	570.0	35.1
15.07.1987	22.07.1987	22.1	592.1	57.2
22.07.1987	28.07.1987	2.0	594.1	59.2
28.07.1987	01.08.1987	0.0	594.1	59.2
01.08.1987	07.08.1987	2.1	596.2	61.3
07.08.1987	08.08.1987	-0.3	595.9	61.0
08.08.1987	15.08.1987	1.4	597.3	62.4
15.08.1987	21.08.1987	0.0	597.3	62.4
21.08.1987	22.08.1987	1.2	598.5	63.6
22.08.1987	27.08.1987	-2.9	595.6	60.7
27.08.1987	29.08.1987	-0.4	595.2	60.3
29.08.1987	04.09.1987	1.3	596.5	61.6
04.09.1987	10.09.1987	1.9	598.4	63.5
10.09.1987	19.09.1987	-3.8	594.6	59.7
19.09.1987	26.09.1987	3.1	597.7	62.8
26.09.1987	03.10.1987	0.5	598.2	63.3
03.10.1987	10.10.1987	0.0	598.2	63.3
10.10.1987	17.10.1987	-0.3	597.9	63.0
17.10.1987	24.10.1987	-0.2	597.7	62.8
24.10.1987	31.10.1987	-0.5	597.2	62.3
31.10.1987	07.11.1987	1.4	598.6	63.7
07.11.1987	14.11.1987	10.2	608.8	73.9
14.11.1987	21.11.1987	1.2	610.0	75.1
21.11.1987	28.11.1987	-0.7	609.3	74.4
28.11.1987	05.12.1987	-0.8	608.5	73.6
05.12.1987	12.12.1987	13.5	622.0	87.1
12.12.1987	19.12.1987	1.5	623.5	88.6
19.12.1987	26.12.1987	-1.2	622.3	87.4
				0.0
26.12.1987	03.01.1988	-0.1	622.2	-0.1
03.01.1988	09.01.1988	-6.1	616.1	-6.2
09.01.1988	16.01.1988	15.4	631.5	9.2
16.01.1988	23.01.1988	-2.0	629.5	7.2
23.01.1988	30.01.1988	0.7	630.2	7.9
30.01.1988	06.02.1988	1.0	631.2	8.9
06.02.1988	20.02.1988	-1.0	630.2	7.9
20.02.1988	27.02.1988	8.9	639.1	16.8
27.02.1988	05.03.1988	1.8	640.9	18.6
05.03.1988	12.03.1988	9.0	649.9	27.6
12.03.1988	19.03.1988	0.9	650.8	28.5
19.03.1988	26.03.1988	2.5	653.3	31.0
26.03.1988	02.04.1988	6.0	659.3	37.0
02.04.1988	09.04.1988	13.7	673.0	50.7
09.04.1988	17.04.1988	0.3	673.3	51.0
17.04.1988	23.04.1988	3.5	676.8	54.5
23.04.1988	30.04.1988	-0.2	676.6	54.3
30.04.1988	07.05.1988	-1.7	674.9	52.6
07.05.1988	14.05.1988	-2.5	672.4	50.1
14.05.1988	21.05.1988	-0.1	672.3	50.0
21.05.1988	28.05.1988	3.0	675.3	53.0
28.05.1988	03.06.1988	5.9	681.2	58.9
03.06.1988	11.06.1988	-8.6	672.6	50.3
11.06.1988	18.06.1988	-1.3	671.3	49.0
18.06.1988	25.06.1988	-0.3	671.0	48.7
25.06.1988	02.07.1988	1.9	672.9	50.6
02.07.1988	11.07.1988	2.8	675.7	53.4
11.07.1988	16.07.1988	2.5	678.2	55.9
16.07.1988	23.07.1988	1.6	679.8	57.5
23.07.1988	30.07.1988	0.3	680.1	57.8
30.07.1988	06.08.1988	-0.5	679.6	57.3
06.08.1988	13.08.1988	0.5	680.1	57.8
13.08.1988	20.08.1988	-2.3	677.8	55.5
20.08.1988	03.09.1988	0.0	677.8	55.5
03.09.1988	10.09.1988	0.4	678.2	55.9
10.09.1988	17.09.1988	0.0	678.2	55.9
17.09.1988	24.09.1988	-0.1	678.1	55.8

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
24.09.1988	08.10.1988	0.1	678.2	55.9
08.10.1988	15.10.1988	-0.3	677.9	55.6
15.10.1988	22.10.1988	0.4	678.3	56.0
22.10.1988	29.10.1988	-1.2	677.1	54.8
29.10.1988	05.11.1988	-0.1	677.0	54.7
05.11.1988	12.11.1988	0.3	677.3	55.0
12.11.1988	19.11.1988	-0.2	677.1	54.8
19.11.1988	26.11.1988	5.5	682.6	60.3
26.11.1988	03.12.1988	11.6	694.2	71.9
03.12.1988	10.12.1988	0.8	695.0	72.7
10.12.1988	17.12.1988	3.9	698.9	76.6
17.12.1988	31.12.1988	5.0	703.9	81.6
				0.0
31.12.1988	14.01.1989	1.3	705.2	1.3
14.01.1989	21.01.1989	-0.8	704.4	0.5
21.01.1989	29.01.1989	1.2	705.6	1.7
29.01.1989	04.02.1989	-2.3	703.3	-0.6
04.02.1989	11.02.1989	-1.2	702.1	-1.8
11.02.1989	18.02.1989	2.1	704.2	0.3
18.02.1989	25.02.1989	6.2	710.4	6.5
25.02.1989	04.03.1989	3.4	713.8	9.9
04.03.1989	11.03.1989	0.8	714.6	10.7
11.03.1989	18.03.1989	2.2	716.8	12.9
18.03.1989	25.03.1989	0.0	716.8	12.9
25.03.1989	01.04.1989	5.8	722.6	18.7
01.04.1989	15.04.1989	-9.6	713.0	9.1
15.04.1989	23.04.1989	3.0	716.0	12.1
23.04.1989	29.04.1989	8.6	724.6	20.7
29.04.1989	06.05.1989	3.0	727.6	23.7
06.05.1989	13.05.1989	11.6	739.2	35.3
13.05.1989	20.05.1989	1.4	740.6	36.7
20.05.1989	04.06.1989	16.7	757.3	53.4
04.06.1989	11.06.1989	8.0	765.3	61.4
11.06.1989	17.06.1989	0.3	765.6	61.7
17.06.1989	24.06.1989	0.5	766.1	62.2
24.06.1989	02.07.1989	0.3	766.4	62.5
02.07.1989	08.07.1989	-4.7	761.7	57.8
08.07.1989	15.07.1989	0.8	762.5	58.6
15.07.1989	22.07.1989	-0.3	762.2	58.3
22.07.1989	30.07.1989	1.5	763.7	59.8
30.07.1989	06.08.1989	1.0	764.7	60.8
06.08.1989	12.08.1989	0.9	765.6	61.7
12.08.1989	20.08.1989	-2.2	763.4	59.5
20.08.1989	26.08.1989	0.9	764.3	60.4
26.08.1989	03.09.1989	-0.7	763.6	59.7
03.09.1989	09.09.1989	0.1	763.7	59.8
09.09.1989	17.09.1989	0.3	764.0	60.1
17.09.1989	23.09.1989	-1.2	762.8	58.9
23.09.1989	01.10.1989	0.3	763.1	59.2
01.10.1989	22.10.1989	-1.0	762.1	58.2
22.10.1989	29.10.1989	2.3	764.4	60.5
29.10.1989	05.11.1989	2.9	767.3	63.4
05.11.1989	12.11.1989	-2.1	765.2	61.3
12.11.1989	17.11.1989	2.4	767.6	63.7
17.11.1989	26.11.1989	1.5	769.1	65.2
26.11.1989	03.12.1989	2.4	771.5	67.6
03.12.1989	10.12.1989	-0.3	771.2	67.3
10.12.1989	16.12.1989	-0.4	770.8	66.9
16.12.1989	24.12.1989	-0.8	770.0	66.1
24.12.1989	31.12.1989	-3.3	766.7	62.8
				0.0
31.12.1989	07.01.1990	-3.0	763.7	-3.0
07.01.1990	13.01.1990	-3.0	760.7	-6.0
13.01.1990	20.01.1990	2.0	762.7	-4.0
20.01.1990	28.01.1990	-1.5	761.2	-5.5
28.01.1990	02.02.1990	5.4	766.6	-0.1

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
02.02.1990	11.02.1990	-1.5	765.1	-1.6
11.02.1990	18.02.1990	-2.3	762.8	-3.9
18.02.1990	25.02.1990	-1.2	761.6	-5.1
25.02.1990	04.03.1990	3.4	765.0	-1.7
04.03.1990	11.03.1990	3.3	768.3	1.6
11.03.1990	17.03.1990	1.9	770.2	3.5
17.03.1990	24.03.1990	4.1	774.3	7.6
24.03.1990	31.03.1990	2.1	776.4	9.7
31.03.1990	07.04.1990	0.8	777.2	10.5
07.04.1990	13.04.1990	-2.2	775.0	8.3
13.04.1990	21.04.1990	-0.6	774.4	7.7
21.04.1990	01.05.1990	1.7	776.1	9.4
01.05.1990	06.05.1990	0.3	776.4	9.7
06.05.1990	12.05.1990	0.4	776.8	10.1
12.05.1990	19.05.1990	1.8	778.6	11.9
19.05.1990	28.05.1990	3.2	781.8	15.1
28.05.1990	03.06.1990	0.6	782.4	15.7
03.06.1990	09.06.1990	1.3	783.7	17.0
09.06.1990	17.06.1990	-0.4	783.3	16.6
17.06.1990	23.06.1990	-0.7	782.6	15.9
23.06.1990	02.07.1990	5.2	787.8	21.1
02.07.1990	08.07.1990	2.1	789.9	23.2
08.07.1990	14.07.1990	-1.3	788.6	21.9
14.07.1990	21.07.1990	0.8	789.4	22.7
21.07.1990	28.07.1990	0.0	789.4	22.7
28.07.1990	04.08.1990	-1.5	787.9	21.2
04.08.1990	11.08.1990	0.2	788.1	21.4
11.08.1990	19.08.1990	2.5	790.6	23.9
19.08.1990	25.08.1990	2.8	793.4	26.7
25.08.1990	09.09.1990	-4.2	789.2	22.5
09.09.1990	16.09.1990	1.5	790.7	24.0
16.09.1990	21.09.1990	-0.4	790.3	23.6
21.09.1990	30.09.1990	-1.7	788.6	21.9
30.09.1990	06.10.1990	1.0	789.6	22.9
06.10.1990	13.10.1990	-0.2	789.4	22.7
13.10.1990	20.10.1990	-0.4	789.0	22.3
20.10.1990	29.10.1990	-0.6	788.4	21.7
29.10.1990	03.11.1990	0.4	788.8	22.1
03.11.1990	10.11.1990	-2.1	786.7	20.0
10.11.1990	26.11.1990	50.2	836.9	70.2
26.11.1990	01.12.1990	-0.8	836.1	69.4
01.12.1990	08.12.1990	-0.6	835.5	68.8
08.12.1990	15.12.1990	7.0	842.5	75.8
15.12.1990	22.12.1990	2.6	845.1	78.4
22.12.1990	29.12.1990	-4.2	840.9	74.2
				0.0
29.12.1990	05.01.1991	-0.6	840.3	-0.6
05.01.1991	12.01.1991	2.0	842.3	1.4
12.01.1991	20.01.1991	0.2	842.5	1.6
20.01.1991	27.01.1991	-0.6	841.9	1.0
27.01.1991	03.02.1991	2.9	844.8	3.9
03.02.1991	09.02.1991	2.1	846.9	6.0
09.02.1991	16.02.1991	-0.2	846.7	5.8
16.02.1991	23.02.1991	1.3	848.0	7.1
23.02.1991	03.03.1991	-1.9	846.1	5.2
03.03.1991	16.03.1991	0.1	846.2	5.3
16.03.1991	23.03.1991	7.4	853.6	12.7
23.03.1991	30.03.1991	1.1	854.7	13.8
30.03.1991	06.04.1991	1.0	855.7	14.8
06.04.1991	13.04.1991	0.7	856.4	15.5
13.04.1991	21.04.1991	-1.3	855.1	14.2
21.04.1991	27.04.1991	6.4	861.5	20.6
27.04.1991	05.05.1991	2.9	864.4	23.5
05.05.1991	11.05.1991	-3.4	861.0	20.1
11.05.1991	18.05.1991	1.2	862.2	21.3
18.05.1991	26.05.1991	11.6	873.8	32.9

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
26.05.1991	02.06.1991	-1.0	872.8	31.9
02.06.1991	09.06.1991	-0.1	872.7	31.8
09.06.1991	16.06.1991	0.5	873.2	32.3
16.06.1991	22.06.1991	-0.6	872.6	31.7
22.06.1991	29.06.1991	3.0	875.6	34.7
29.06.1991	06.07.1991	8.5	884.1	43.2
06.07.1991	14.07.1991	-1.6	882.5	41.6
14.07.1991	21.07.1991	-0.7	881.8	40.9
21.07.1991	27.07.1991	0.2	882.0	41.1
27.07.1991	03.08.1991	0.8	882.8	41.9
03.08.1991	11.08.1991	2.3	885.1	44.2
11.08.1991	18.08.1991	1.5	886.6	45.7
18.08.1991	25.08.1991	-3.6	883.0	42.1
25.08.1991	01.09.1991	-0.1	882.9	42.0
01.09.1991	08.09.1991	0.5	883.4	42.5
08.09.1991	14.09.1991	14.6	898.0	57.1
14.09.1991	22.09.1991	-7.0	891.0	50.1
22.09.1991	28.09.1991	0.0	891.0	50.1
28.09.1991	06.10.1991	0.0	891.0	50.1
06.10.1991	13.10.1991	-1.3	889.7	48.8
13.10.1991	20.10.1991	0.1	889.8	48.9
20.10.1991	26.10.1991	5.3	895.1	54.2
26.10.1991	03.11.1991	-1.4	893.7	52.8
03.11.1991	10.11.1991	0.6	894.3	53.4
10.11.1991	17.11.1991	8.4	902.7	61.8
17.11.1991	24.11.1991	-1.4	901.3	60.4
24.11.1991	01.12.1991	0.2	901.5	60.6
01.12.1991	08.12.1991	-0.1	901.4	60.5
08.12.1991	15.12.1991	1.3	902.7	61.8
15.12.1991	22.12.1991	-0.7	902.0	61.1
22.12.1991	28.12.1991	-5.3	896.7	55.8
			896.7	0.0
28.12.1991	05.01.1992	-10.4	886.3	-10.4
05.01.1992	11.01.1992	6.4	892.7	-4.0
11.01.1992	19.01.1992	11.5	904.2	7.5
19.01.1992	26.01.1992	1.6	905.8	9.1
26.01.1992	02.02.1992	-2.3	903.5	6.8
02.02.1992	08.02.1992	-0.6	902.9	6.2
08.02.1992	16.02.1992	-0.4	902.5	5.8
16.02.1992	23.02.1992	0.8	903.3	6.6
23.02.1992	01.03.1992	8.1	911.4	14.7
01.03.1992	05.03.1992	-1.1	910.3	13.6
05.03.1992	22.03.1992	8.3	918.6	21.9
22.03.1992	06.04.1992	2.2	920.8	24.1
06.04.1992	27.04.1992	2.8	923.6	26.9
27.04.1992	30.05.1992	-6.2	917.4	20.7
30.05.1992	29.06.1992	6.6	924.0	27.3
29.06.1992	29.08.1992	9.1	933.1	36.4
29.08.1992	01.10.1992	0.9	934.0	37.3
01.10.1992	26.10.1992	29	963.0	66.3
26.10.1992	01.12.1992	-0.6	962.4	65.7
01.12.1992	03.01.1993	-2.0	960.4	63.7
			960.4	0.0
03.01.1993	02.02.1993	-2.1	958.3	-2.1
02.02.1993	02.03.1993	5.3	963.6	3.2
02.03.1993	04.05.1993	2.1	965.7	5.3
04.05.1993	29.06.1993	25.1	990.8	30.4
29.06.1993	03.08.1993	0.2	991.0	30.6
03.08.1993	25.09.1993	1.9	992.9	32.5
25.09.1993	04.11.1993	3.0	995.9	35.5
04.11.1993	03.12.1993	2.4	998.3	37.9

Neumayer Station (70°39'31", 8°15'9"W)

Date From	to	Accumulation (cm snow)	Cum. Acc. (cm snow)	Yearly cum. acc. (cm snow)
	08.03.1992	0.0	0.0	0.0
08.03.1992	21.03.1992	24.1	24.1	24.1
21.03.1992	30.03.1992	3.0	27.1	27.1
30.03.1992	04.04.1992	2.0	29.1	29.1
04.04.1992	11.04.1992	1.8	30.9	30.9
11.04.1992	18.04.1992	-0.5	30.4	30.4
18.04.1992	25.04.1992	1.1	31.5	31.5
25.04.1992	02.05.1992	-1.4	30.1	30.1
02.05.1992	10.05.1992	-0.6	29.5	29.5
10.05.1992	16.05.1992	1.0	30.5	30.5
16.05.1992	23.05.1992	-0.1	30.4	30.4
23.05.1992	30.05.1992	0.1	30.5	30.5
30.05.1992	07.06.1992	-0.3	30.2	30.2
07.06.1992	13.06.1992	1.9	32.1	32.1
13.06.1992	27.06.1992	1.6	33.7	33.7
27.06.1992	04.07.1992	1.8	35.5	35.5
04.07.1992	11.07.1992	7.5	43.0	43.0
11.07.1992	18.07.1992	1.0	44.0	44.0
18.07.1992	25.07.1992	0.4	44.4	44.4
25.07.1992	01.08.1992	0.6	45.0	45.0
01.08.1992	08.08.1992	0.6	45.6	45.6
08.08.1992	15.08.1992	1.1	46.7	46.7
15.08.1992	22.08.1992	0.2	46.9	46.9
22.08.1992	29.08.1992	-0.2	46.7	46.7
30.08.1992	05.09.1992	0.0	46.7	46.7
05.09.1992	12.09.1992	-0.1	46.6	46.6
12.09.1992	19.09.1992	0.0	46.6	46.6
19.09.1992	26.09.1992	0.4	47.0	47.0
26.09.1992	03.10.1992	0.1	47.1	47.1
03.10.1992	10.10.1992	0.1	47.2	47.2
10.10.1992	18.10.1992	16.3	63.5	63.5
18.10.1992	25.10.1992	7.6	71.1	71.1
25.10.1992	31.10.1992	-4.5	66.6	66.6
31.10.1992	14.11.1992	11.6	78.2	78.2
14.11.1992	21.11.1992	2.2	80.4	80.4
21.11.1992	28.11.1992	2.8	83.2	83.2
28.11.1992	05.12.1992	0.4	83.6	83.6
05.12.1992	12.12.1992	1.3	84.9	84.9
12.12.1992	19.12.1992	-2.2	82.7	82.7
19.12.1992	26.12.1992	-1.2	81.5	81.5
26.12.1992	02.01.1993	0.2	81.7	81.7
	02.01.1993	0.0	81.7	0.0
02.01.1993	09.01.1993	7.3	89.0	7.3
09.01.1993	16.01.1993	1.5	90.5	8.8
16.01.1993	23.01.1993	1.7	92.2	10.5
23.01.1993	30.01.1993	-2.3	89.9	8.2
30.01.1993	06.02.1993	0.7	90.6	8.9
06.02.1993	13.02.1993	0.7	91.3	9.6
13.02.1993	20.02.1993	-1.1	90.2	8.5
20.02.1993	28.02.1993	1.1	91.3	9.6
28.02.1993	06.03.1993	0.0	91.3	9.6
06.03.1993	13.03.1993	1.6	92.9	11.2
13.03.1993	20.03.1993	1.5	94.4	12.7
20.03.1993	23.03.1993	3.3	97.7	16.0
23.03.1993	27.03.1993	-0.5	97.2	15.5
27.03.1993	03.04.1993	3.6	100.8	19.1
03.04.1993	10.04.1993	1.4	102.2	20.5
10.04.1993	17.04.1993	1.1	103.3	21.6
17.04.1993	24.04.1993	0.4	103.7	22.0
24.04.1993	04.05.1993	14.3	118.0	36.3
04.05.1993	09.05.1993	-3.7	114.3	32.6
09.05.1993	16.05.1993	6.7	121.0	39.3
16.05.1993	22.05.1993	15.2	136.2	54.5

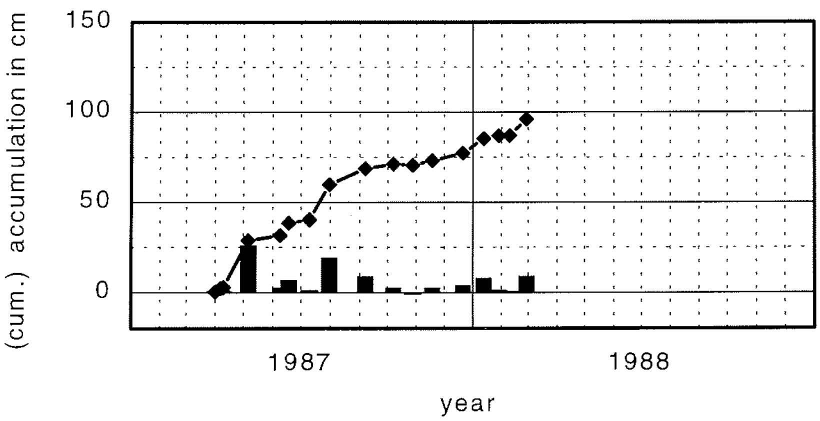
Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
22.05.1993	29.05.1993	-11.1	125.1	43.4
29.05.1993	06.06.1993	0.2	125.3	43.6
06.06.1993	12.06.1993	0.0	125.3	43.6
12.06.1993	19.06.1993	0.3	125.6	43.9
19.06.1993	26.06.1993	-0.7	124.9	43.2
26.06.1993	03.07.1993	0.7	125.6	43.9
03.07.1993	11.07.1993	3.0	128.6	46.9
11.07.1993	18.07.1993	-2.4	126.2	44.5
18.07.1993	25.07.1993	5.7	131.9	50.2
25.07.1993	31.07.1993	-5.9	126.0	44.3
31.07.1993	07.08.1993	-0.1	125.9	44.2
07.08.1993	14.08.1993	0.4	126.3	44.6
14.08.1993	21.08.1993	-0.3	126.0	44.3
21.08.1993	28.08.1993	2.3	128.3	46.6
28.08.1993	05.09.1993	2.3	130.6	48.9
05.09.1993	12.09.1993	0.2	130.8	49.1
12.09.1993	18.09.1993	0.2	131.0	49.3
18.09.1993	25.09.1993	0.3	131.3	49.6
25.09.1993	05.10.1993	10.1	141.4	59.7
05.10.1993	09.10.1993	0.4	141.8	60.1
09.10.1993	16.10.1993	1.5	143.3	61.6
16.10.1993	24.10.1993	-3.6	139.7	58.0
24.10.1993	30.10.1993	0.9	140.6	58.9
30.10.1993	06.11.1993	-2.6	138.0	56.3
06.11.1993	13.11.1993	-0.5	137.5	55.8
13.11.1993	21.11.1993	-1.0	136.5	54.8
21.11.1993	27.11.1993	0.1	136.6	54.9
27.11.1993	03.12.1993	0.9	137.5	55.8
03.12.1993	12.12.1993	0.0	137.5	55.8
12.12.1993	18.12.1993	-1.8	135.7	54.0
18.12.1993	25.12.1993	-0.4	135.3	53.6
25.12.1993	01.01.1994	-0.4	134.9	53.2
	01.01.1994	0.0	134.9	0.0
01.01.1994	08.01.1994	2.4	137.3	2.4
08.01.1994	21.01.1994	4.9	142.2	7.3
21.01.1994	29.01.1994	4.3	146.5	11.6
29.01.1994	04.02.1994	1.0	147.5	12.6
04.02.1994	12.02.1994	12.3	159.8	24.9
12.02.1994	20.02.1994	9.4	169.2	34.3
20.02.1994	26.02.1994	-1.8	167.4	32.5
26.02.1994	05.03.1994	1.7	169.1	34.2
05.03.1994	13.03.1994	-2.7	166.4	31.5
13.03.1994	19.03.1994	-0.9	165.5	30.6
19.03.1994	26.03.1994	0.0	165.5	30.6
26.03.1994	02.04.1994	0.1	165.6	30.7
02.04.1994	09.04.1994	-0.2	165.4	30.5
09.04.1994	14.04.1994	0.6	166.0	31.1
14.04.1994	23.04.1994	-0.8	165.2	30.3
23.04.1994	01.05.1994	-0.7	164.5	29.6
01.05.1994	07.05.1994	1.1	165.6	30.7
07.05.1994	14.05.1994	12.1	177.7	42.8
14.05.1994	21.05.1994	0.1	177.8	42.9
21.05.1994	29.05.1994	-4.9	172.9	38.0
29.05.1994	04.06.1994	1.4	174.3	39.4
04.06.1994	11.06.1994	-0.9	173.4	38.5
11.06.1994	19.06.1994	0.3	173.7	38.8
19.06.1994	25.06.1994	-0.6	173.1	38.2
25.06.1994	02.07.1994	-0.2	172.9	38.0
02.07.1994	09.07.1994	1.5	174.4	39.5
09.07.1994	16.07.1994	-1.0	173.4	38.5
16.07.1994	23.07.1994	-0.2	173.2	38.3
23.07.1994	30.07.1994	0.0	173.2	38.3
30.07.1994	07.08.1994	-0.3	172.9	38.0
07.08.1994	13.08.1994	5.9	178.8	43.9
13.08.1994	25.08.1994	5.1	183.9	49.0

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
25.08.1994	02.09.1994	4.2	188.1	53.2
02.09.1994	10.09.1994	-1.7	186.4	51.5
10.09.1994	17.09.1994	0.0	186.4	51.5
17.09.1994	21.09.1994	3.4	189.8	54.9
21.09.1994	30.09.1994	-1.6	188.2	53.3
30.09.1994	08.10.1994	-0.7	187.5	52.6
08.10.1994	15.10.1994	2.1	189.6	54.7
15.10.1994	22.10.1994	-0.8	188.8	53.9
22.10.1994	01.11.1994	-1.3	187.5	52.6
01.11.1994	12.11.1994	11.4	198.9	64.0
12.11.1994	19.11.1994	-0.6	198.3	63.4
19.11.1994	26.11.1994	9.1	207.4	72.5
26.11.1994	03.12.1994	-1.8	205.6	70.7
03.12.1994	10.12.1994	-1.8	203.8	68.9
10.12.1994	17.12.1994	4.7	208.5	73.6
17.12.1994	28.12.1994	11.4	219.9	85.0
28.12.1994	07.01.1995	0.1	220.0	85.1
	01.01.1995	0.0	220.0	0.0
01.01.1995	14.01.1995	-1.2	218.8	2.9
14.01.1995	23.01.1995	0.3	219.1	3.2
23.01.1995	28.01.1995	-0.2	218.9	3.0
28.01.1995	04.02.1995	1.2	220.1	4.2
04.02.1995	11.02.1995	2.6	222.7	6.8
11.02.1995	18.02.1995	0.3	223.0	7.1
18.02.1995	25.02.1995	2.0	225.0	9.1
25.02.1995	04.03.1995	1.5	226.5	10.6
04.03.1995	13.03.1995	3.5	230.0	14.1
13.03.1995	18.03.1995	7.3	237.3	21.4
18.03.1995	25.03.1995	5.3	242.6	26.7
25.03.1995	01.04.1995	-1.7	240.9	25.0
01.04.1995	08.04.1995	2.8	243.7	27.8
08.04.1995	15.04.1995	-0.1	243.6	27.7
15.04.1995	19.04.1995	25.6	269.2	53.3
19.04.1995	20.04.1995	7.6	276.8	60.9
20.04.1995	21.04.1995	-8.7	268.1	52.2
21.04.1995	30.04.1995	-2.4	265.7	49.8
30.04.1995	06.05.1995	4.2	269.9	54.0
06.05.1995	13.05.1995	2.2	272.1	56.2
13.05.1995	20.05.1995	0.7	272.8	56.9
20.05.1995	27.05.1995	-2.2	270.6	54.7
27.05.1995	03.06.1995	-0.9	269.7	53.8
03.06.1995	10.06.1995	0.5	270.2	54.3
10.06.1995	18.06.1995	-0.1	270.1	54.2
18.06.1995	25.06.1995	-0.3	269.8	53.9
25.06.1995	01.07.1995	-0.1	269.7	53.8
01.07.1995	08.07.1995	-0.2	269.5	53.6
08.07.1995	15.07.1995	1.3	270.8	54.9
15.07.1995	24.07.1995	-0.5	270.3	54.4
24.07.1995	29.07.1995	0.5	270.8	54.9
29.07.1995	05.08.1995	2.6	273.4	57.5
05.08.1995	15.08.1995	-2.2	271.2	55.3
15.08.1995	19.08.1995	-0.8	270.4	54.5
19.08.1995	27.08.1995	-0.1	270.3	54.4
27.08.1995	02.09.1995	5.8	276.1	60.2
02.09.1995	09.09.1995	2.3	278.4	62.5
09.09.1995	16.09.1995	0.1	278.5	62.6
16.09.1995	23.09.1995	9.2	287.7	71.8
23.09.1995	30.09.1995	-0.1	287.6	71.7
30.09.1995	07.10.1995	-1.1	286.5	70.6
07.10.1995	15.10.1995	6.2	292.7	76.8
15.10.1995	21.10.1995	7.0	299.7	83.8
21.10.1995	28.10.1995	-2.4	297.2	81.4
28.10.1995	04.11.1995	-2.1	295.2	79.3
04.11.1995	11.11.1995	-1.2	294.0	78.1
11.11.1995	19.11.1995	-1.4	292.6	76.7

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
19.11.1995	25.11.1995	-1.0	291.6	75.7
25.11.1995	02.12.1995	-1.3	290.3	74.4
02.12.1995	10.12.1995	2.4	292.7	76.8
10.12.1995	16.12.1995	3.2	295.9	80.0
16.12.1995	24.12.1995	12.5	308.4	92.5
24.12.1995	31.12.1995	4.1	312.5	96.6
	01.01.1996	0.0	312.5	0.0
01.01.1996	06.01.1996	-6.1	306.4	-8.5
06.01.1996	13.01.1996	4.0	310.4	-4.5
13.01.1996	20.01.1996	-2.9	307.5	-7.4
20.01.1996	27.01.1996	7.1	314.6	-0.3
27.01.1996	03.02.1996	-2.3	312.3	-2.6
03.02.1996	09.02.1996	-4.9	307.4	-7.5
09.02.1996	17.02.1996	2.2	309.6	-5.3
17.02.1996	24.02.1996	1.0	310.6	-4.3
24.02.1996	03.03.1996	5.6	316.2	1.3
03.03.1996	10.03.1996	4.4	320.6	5.8
10.03.1996	15.03.1996	9.1	329.7	14.9
15.03.1996	22.03.1996	7.2	336.9	22.0
22.03.1996	30.03.1996	-0.5	336.4	21.5
30.03.1996	06.04.1996	0.6	337.0	22.1
06.04.1996	14.04.1996	0.7	337.7	22.9
14.04.1996	20.04.1996	2.0	339.7	24.8
20.04.1996	27.04.1996	1.6	341.2	26.4
27.04.1996	04.05.1996	0.5	341.7	26.9
04.05.1996	10.05.1996	-8.5	333.2	18.4
10.05.1996	18.05.1996	3.8	337.0	22.2
18.05.1996	25.05.1996	-13.0	324.0	9.2
25.05.1996	02.06.1996	0.6	324.6	9.8
02.06.1996	08.06.1996	-0.3	324.3	9.5
08.06.1996	15.06.1996	0.6	324.9	10.1
15.06.1996	22.06.1996	0.1	325.0	10.2
22.06.1996	29.06.1996	0.8	325.8	11.0
29.06.1996	06.07.1996	1.2	327.0	12.2
06.07.1996	13.07.1996	-0.5	326.5	11.7
13.07.1996	20.07.1996	1.3	327.8	13.0
20.07.1996	27.07.1996	7.2	335.0	20.2
27.07.1996	03.08.1996	3.5	338.5	23.7
03.08.1996	10.08.1996	3.0	341.5	26.7
10.08.1996	17.08.1996	1.3	342.8	28.0
17.08.1996	25.08.1996	8.6	351.4	36.6
25.08.1996	31.08.1996	0.1	351.5	36.7
31.08.1996	07.09.1996	-4.1	347.4	32.6
07.09.1996	14.09.1996	24.2	371.6	56.8
14.09.1996	21.09.1996	-9.9	361.7	46.9
21.09.1996	28.09.1996	-0.7	361.0	46.2
28.09.1996	05.10.1996	-0.1	361.0	46.1
05.10.1996	12.10.1996	3.2	364.2	49.3
12.10.1996	19.10.1996	-2.6	361.6	46.7
19.10.1996	26.10.1996	-0.9	360.7	45.8
26.10.1996	02.11.1996	4.4	365.1	50.2
02.11.1996	09.11.1996	2.0	367.1	52.2
09.11.1996	17.11.1996	14.8	381.9	67.0
17.11.1996	23.11.1996	0.5	382.4	67.5
23.11.1996	30.11.1996	-0.6	381.8	66.9
30.11.1996	07.12.1996	1.6	383.4	68.5
07.12.1996	14.12.1996	-2.8	380.6	65.7
14.12.1996	21.12.1996	10.5	391.1	76.2
21.12.1996	28.12.1996	-12.9	378.2	63.3

15km South (70°45'S 8°22'W)

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)
14.03.87	01.04.87	0.4	0.4
01.04.87	07.04.87	2.0	2.4
07.04.87	10.04.87	0.6	3.0
10.04.87	06.05.87	26.0	29.0
06.05.87	09.06.87	2.7	31.7
09.06.87	18.06.87	6.9	38.6
18.06.87	10.07.87	1.8	40.4
10.07.87	31.07.87	19.3	59.7
31.07.87	07.09.87	8.9	68.6
07.09.87	07.10.87	2.7	71.3
07.10.87	28.10.87	-0.8	70.5
28.10.87	18.11.87	2.7	73.2
18.11.87	21.12.87	4.1	77.3
21.12.87	13.01.88	8.1	85.4
13.01.88	29.01.88	1.6	87.0
29.01.88	10.02.88	0.1	87.1
10.02.88	28.02.88	9.1	96.2

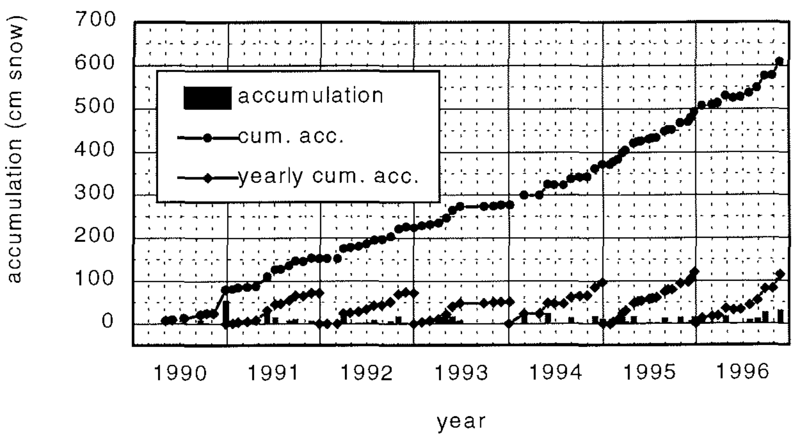


Accumulation and cumulative accumulation at 15km South, 1987/88

15km South (70°45'S 8°22'W)

Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
20.03.1990	08.05.1990	7.1	7.1	7.1
08.05.1990	02.06.1990	2.3	9.4	9.4
02.06.1990	19.07.1990	4.1	13.5	13.5
19.07.1990	20.09.1990	8.3	21.8	21.8
20.09.1990	13.10.1990	2.9	24.7	24.7
13.10.1990	09.11.1990	0.1	24.8	24.8
09.11.1990	29.12.1990	55.0	79.8	79.8
	29.12.1990			0.0
29.12.1990	22.01.1991	1.7	81.5	1.7
22.01.1991	12.02.1991	2.9	84.4	4.6
12.02.1991	20.03.1991	1.1	85.5	5.7
20.03.1991	23.04.1991	2.4	87.9	8.1
23.04.1991	06.06.1991	22.9	110.8	31.0
06.06.1991	07.07.1991	15.3	126.1	46.3
07.07.1991	29.07.1991	1.3	127.4	47.6
29.07.1991	31.08.1991	7.6	135.0	55.2
31.08.1991	25.09.1991	11.1	146.1	66.3
25.09.1991	26.10.1991	-0.6	145.5	65.7
26.10.1991	27.11.1991	6.6	152.1	72.3
27.11.1991	28.12.1991	-0.3	151.8	72.0
	28.12.1991			0.0
04.01.1992	28.01.1992	-0.7	151.1	-0.7
	09.03.1992	***	151.1	-0.7
09.03.1992	02.04.1992	24.8	175.9	24.1
02.04.1992	28.04.1992	1.1	177.0	25.2
28.04.1992	31.05.1992	3.5	180.5	28.7
31.05.1992	30.06.1992	4.8	185.3	33.5
30.06.1992	30.07.1992	9.2	194.5	42.7
30.07.1992	29.08.1992	1.8	196.3	44.5
29.08.1992	02.10.1992	6.8	203.1	51.3
02.10.1992	02.11.1992	18.3	221.4	69.6
02.11.1992	30.11.1992	4.6	226.0	74.2
30.11.1992	01.01.1993	-1.7	224.3	72.5
	01.01.1993			0.0
01.01.1993	01.02.1993	4.8	229.1	4.8
01.02.1993	04.03.1993	2.2	231.3	7.0
04.03.1993	06.04.1993	4.4	235.7	11.4
06.04.1993	06.05.1993	10.7	246.4	22.1
06.05.1993	30.05.1993	17.9	264.3	40.0
30.05.1993	28.06.1993	8.8	273.1	48.8
28.06.1993	28.09.1993	0.0	273.1	48.8
28.09.1993	04.11.1993	1.8	274.9	50.6
04.11.1993	03.12.1993	1.1	276.0	51.7
03.12.1993	06.01.1994	***	276.0	51.7
	01.01.1994			0.0
01.01.1994	02.03.1994	23.2	299.2	23.2
02.03.1994	30.04.1994	0.6	299.8	23.8
30.04.1994	02.06.1994	24.2	324.0	48.0
02.06.1994	28.06.1994	-1.0	323.0	47.0
28.06.1994	03.08.1994	***	323.0	47.0
03.08.1994	01.09.1994	14.3	337.3	61.3
01.09.1994	02.10.1994	4.1	341.4	65.4
02.10.1994	01.11.1994	1.2	342.6	66.6
01.11.1994	01.12.1994	18.5	361.1	85.1
01.12.1994	31.12.1994	11.8	372.9	96.9
	01.01.1995			0.0
01.01.1995	29.01.1995	-1.7	371.2	-1.7
29.01.1995	10.02.1995	6.4	377.6	4.7

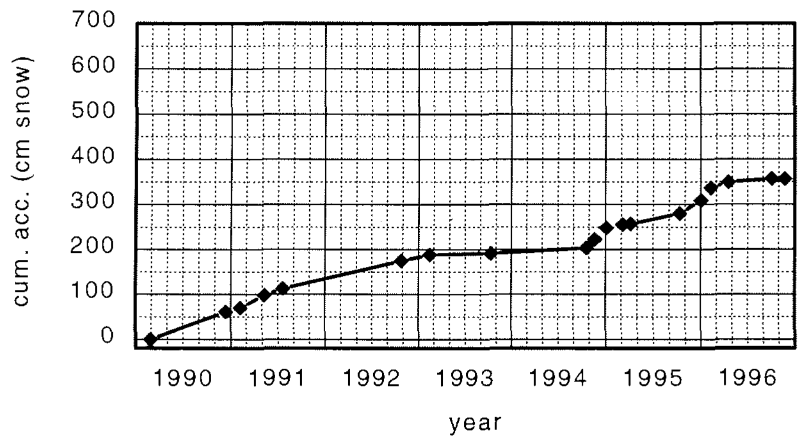
Date from	to	Accumulation (cm snow)	Cum. acc. (cm snow)	Yearly cum. acc. (cm snow)
10.02.1995	01.03.1995	5.6	383.2	10.3
01.03.1995	19.03.1995	15.3	398.5	25.6
19.03.1995	31.03.1995	5.9	404.4	31.5
31.03.1995	02.05.1995	17.3	421.7	48.8
02.05.1995	18.05.1995	3.7	425.4	52.5
18.05.1995	01.06.1995	1.6	427.0	54.1
01.06.1995	02.07.1995	4.0	431.0	58.1
02.07.1995	13.07.1995	1.3	432.3	59.4
13.07.1995	31.07.1995	2.5	434.8	61.9
31.07.1995	01.09.1995	13.9	448.7	75.8
01.09.1995	15.09.1995	3.6	452.3	79.4
15.09.1995	30.09.1995	0.4	452.7	79.8
30.09.1995	01.11.1995	15.0	467.7	94.8
01.11.1995	03.12.1995	2.7	470.4	97.5
03.12.1995	13.12.1995	7.8	478.2	105.3
13.12.1995	26.12.1995	15.5	493.7	120.8
	01.01.1996			0.0
01.01.1996	25.01.1996	13.6	507.3	13.6
25.01.1996	05.03.1996	3.5	510.8	17.1
05.03.1996	27.03.1996	2.3	513.1	19.4
27.03.1996	27.04.1996	17.4	530.5	36.8
27.04.1996	27.05.1996	-4.6	525.9	32.2
27.05.1996	24.06.1996	1.5	527.4	33.7
24.06.1996	29.07.1996	9.3	536.7	43.0
29.07.1996	29.08.1996	12.0	548.7	55.0
29.08.1996	28.09.1996	26.5	575.2	81.5
28.09.1996	28.10.1996	0.7	575.9	82.2
28.10.1996	26.11.1996	31.7	607.6	113.9
26.11.1996	25.12.1996	-0.5	607.1	113.4



Accumulation at stake array 15km South 1990-1996

Watzmann (Halvfarryggen) (70°55'32"S 7°23'35"W)

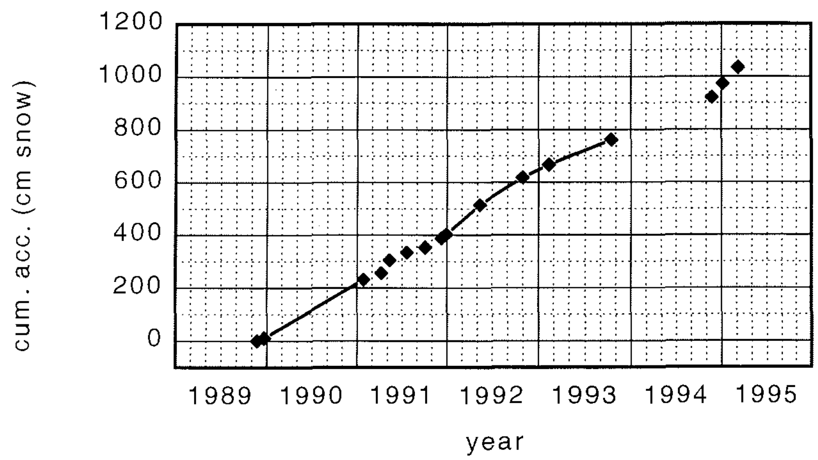
Date from	to	Accumulation (cm snow)	Days	cum. acc. (cm snow)
27.02.1990	15.12.1990	61.4	291	61
15.12.1990	08.02.1991	8.8	55	70
08.02.1991	11.05.1991	27.7	92	98
11.05.1991	21.07.1991	14.9	71	113
21.07.1991	26.10.1992	62.1	463	175
26.10.1992	14.02.1993	12.9	111	188
14.02.1993	12.10.1993	3.0	240	191
08.02.1994	22.10.1994	11.7	256	203
22.10.1994	23.11.1994	19.5	32	222
23.11.1994	05.01.1995	25.7	43	248
05.01.1995	08.03.1995	7.3	62	255
08.03.1995	08.04.1995	1.5	31	257
08.04.1995	13.10.1995	23.0	188	280
13.10.1995	03.01.1996	29.2	82	309
03.01.1996	10.02.1996	27.5	38	337
10.02.1996	18.04.1996	12.5	68	349
18.04.1996	03.10.1996	7.8	168	357
03.10.1996	23.11.1996	-0.5	51	357



Accumulation at Halvfarryggen (Watzmann) 1990-1996

Søråsen (71°14'35"S 9°40'11"W)

Date from	to	Accumulation (cm snow)	Days	Cum. acc. (cm snow)
23.11.1989	21.12.1989	11.1	28	11
21.12.1989	28.01.1991	220	403	231
28.01.1991	08.04.1991	24.8	70	256
08.04.1991	12.05.1991	48.7	34	305
12.05.1991	22.07.1991	29.8	71	334
22.07.1991	04.10.1991	18.1	74	353
04.10.1991	09.12.1991	35.3	66	388
09.12.1991	29.12.1991	14	20	402
29.12.1991	13.05.1992	113.6	136	515
13.05.1992	30.10.1992	103.4	170	619
30.10.1992	11.02.1993	47.9	104	667
11.02.1993	14.10.1993	95	245	762
14.10.1993	13.02.1993	***	0	762
13.02.1994	24.11.1994	159.2	284	921
24.11.1994	06.01.1995	51.9	43	973
06.01.1995	09.03.1995	61.6	62	1034



Accumulation at Søråsen (Olymp) 1989-1995

APPENDIX B

Snow pits

In Appendix B and C the complete data sets for the snow pits and shallow firn cores are given. Additionally the most important variables are plotted. The visual stratigraphy is shown in a simplified way, since there are only minor variations in the type of snow (grain size and form), except for distinct layers or lenses of ice or depth hoar layers, which can be found in the graphs as black bars and as the symbol "^^^^^^^", respectively.

The data sets begin with information about:

Location
Coordinates
Date of sampling
Depth of pit/core
Label

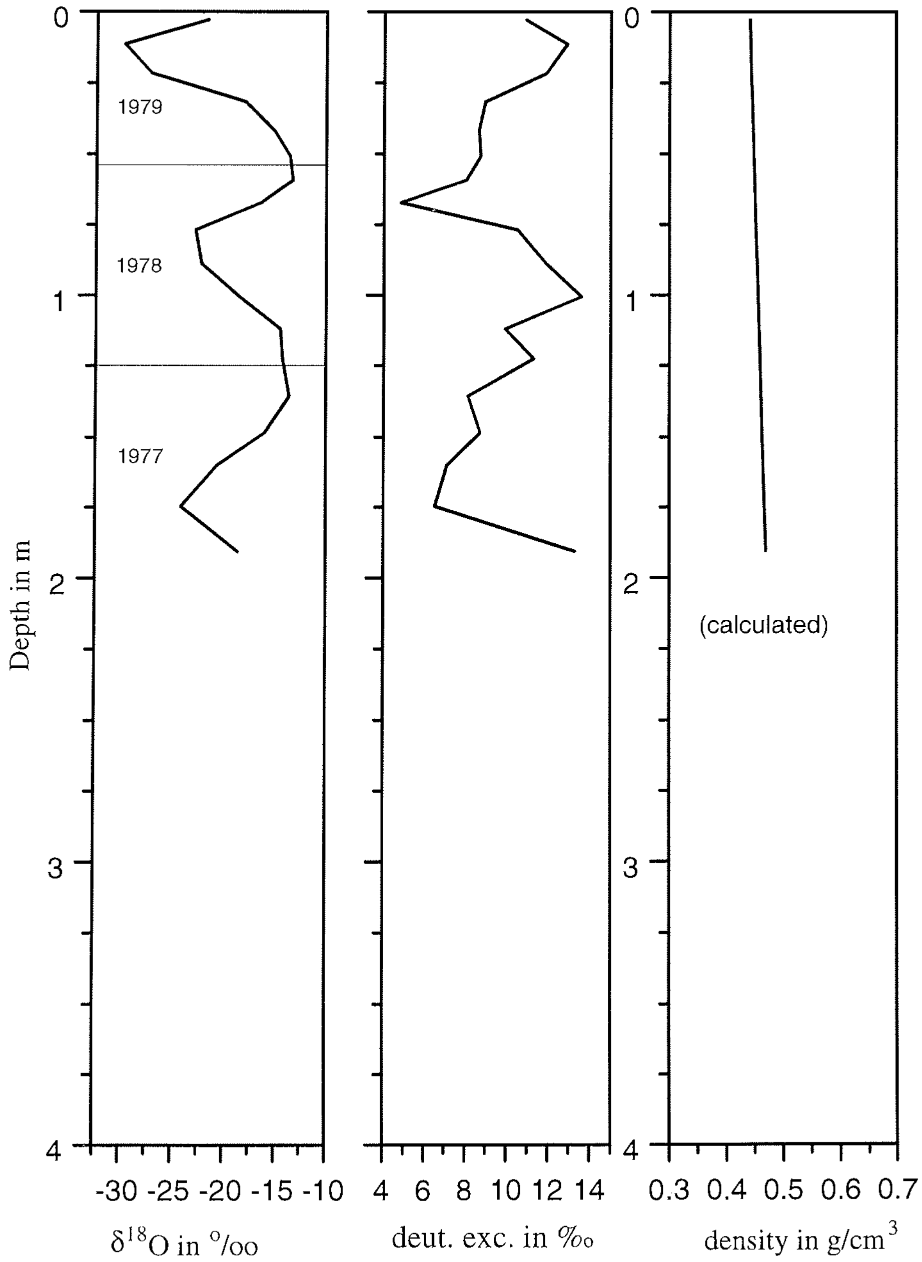
Abbreviations in the tables:

^{2}H	: deuterium content
^{18}O	: oxygen-18 content
d	: deuterium excess
^{3}H	: tritium content
$\sigma(^{3}H)$	: standard deviation of ^{3}H
El.Cond.	: electrolytical conductivity

Georg-von-Neumayer Station

70°37'S 8°22'W
18.02.80
1.98m
AS01

Mean Depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^{3}]
0.030	-162.6	-21.69	10.9	23.5	±1.7		0.441
0.115	-225.6	-29.81	12.9	33.8	±3.0		0.442
0.218	-205.6	-27.19	11.9	36.4	±3.8		0.443
0.317	-135.0	-17.99	8.9	12.4	±1.6		0.445
0.418	-112.6	-15.15	8.6	12.4	±1.6		0.446
0.507	-99.9	-13.58	8.7	14.5	±2.8		0.448
0.593	-98.6	-13.32	8.0	12.5	±3.1		0.449
0.673	-126.6	-16.43	4.8	16.2	±2.6		0.450
0.770	-172.2	-22.84	10.5	26.3	±3.0		0.452
0.890	-166.2	-22.26	11.9	21.7	±3.1		0.454
1.008	-134.6	-18.52	13.6	16.2	±4.8		0.456
1.120	-106.0	-14.49	9.9	13.7	±3.2		0.457
1.227	-102.9	-14.28	11.3	17.2	±3.4		0.459
1.357	-100.9	-13.63	8.1	17.1	±3.4		0.461
1.487	-119.5	-16.03	8.7	17.7	±3.3		0.463
1.600	-158.2	-20.66	7.1	26.4	±3.7		0.465
1.748	-187.0	-24.19	6.5	25.8	±3.1		0.467
1.908	-135.6	-18.61	13.3	17.0	±2.8		0.469

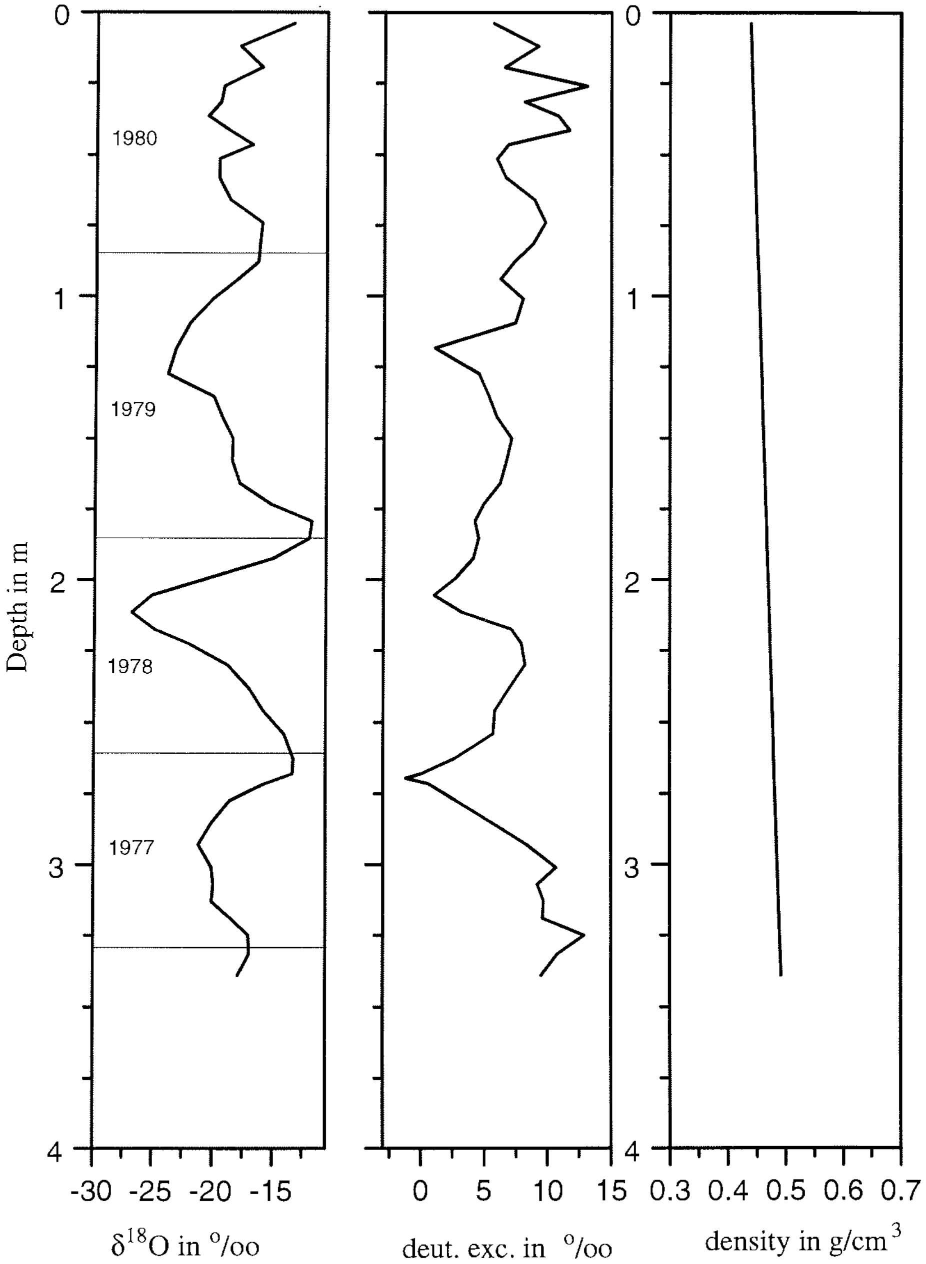


Snow pit, GvN, Feb. 1980

Georg-von-Neumayer Station

70°37'S 8°22'W
Feb. 81
3.60m
AS03

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.040	-101.2	-13.35	5.6				0.441
0.120	-133.7	-17.86	9.2				0.442
0.195	-121.6	-16.01	6.5				0.443
0.260	-140.7	-19.22	13.1				0.444
0.315	-147.5	-19.45	8.1				0.445
0.365	-153.4	-20.53	10.8				0.446
0.415	-138.3	-18.75	11.7				0.446
0.465	-127.5	-16.79	6.8				0.447
0.515	-150.7	-19.58	5.9				0.448
0.580	-150.2	-19.60	6.6				0.449
0.660	-140.3	-18.65	8.9				0.450
0.740	-118.0	-15.97	9.8				0.451
0.815	-120.4	-16.15	8.8				0.453
0.880	-123.0	-16.29	7.3				0.454
0.940	-137.8	-18.00	6.2				0.455
1.010	-153.0	-20.13	8.0				0.456
1.095	-168.8	-22.02	7.4				0.457
1.185	-184.4	-23.18	1.0				0.458
1.275	-186.2	-23.84	4.5				0.460
1.355	-154.6	-19.99	5.3				0.461
1.425	-148.3	-19.28	5.9				0.462
1.500	-139.9	-18.38	7.1				0.463
1.580	-140.7	-18.42	6.7				0.464
1.660	-136.0	-17.78	6.2				0.466
1.735	-116.0	-15.11	4.9				0.467
1.795	-89.4	-11.70	4.2				0.468
1.855	-90.8	-11.91	4.5				0.469
1.925	-115.4	-14.94	4.1				0.470
1.995	-160.3	-20.38	2.7				0.471
2.055	-200.0	-25.12	1.0				0.472
2.115	-211.4	-26.82	3.2				0.473
2.175	-192.0	-24.89	7.1				0.474
2.225	-168.5	-22.05	7.9				0.474
2.300	-141.9	-18.76	8.2				0.475
2.385	-128.3	-16.90	6.9				0.476
2.460	-120.4	-15.77	5.8				0.478
2.540	-106.5	-14.02	5.7				0.479
2.625	-103.2	-13.23	2.7				0.480
2.680	-106.5	-13.31	0.0				0.481
2.695	-115.8	-14.32	-1.2				0.482
2.715	-124.7	-15.66	0.6				0.482
2.775	-145.6	-18.55	2.8				0.483
2.850	-154.7	-20.02	5.5				0.484
2.930	-161.0	-21.16	8.3				0.485
3.010	-149.8	-20.06	10.7				0.486
3.070	-150.2	-19.92	9.2				0.487
3.130	-150.5	-20.03	9.7				0.488
3.190	-137.9	-18.44	9.6				0.489
3.250	-122.9	-16.97	12.9				0.490
3.315	-124.5	-16.91	10.8				0.491
3.390	-133.3	-17.85	9.5				0.492



Snow pit, GvN, Feb.1981

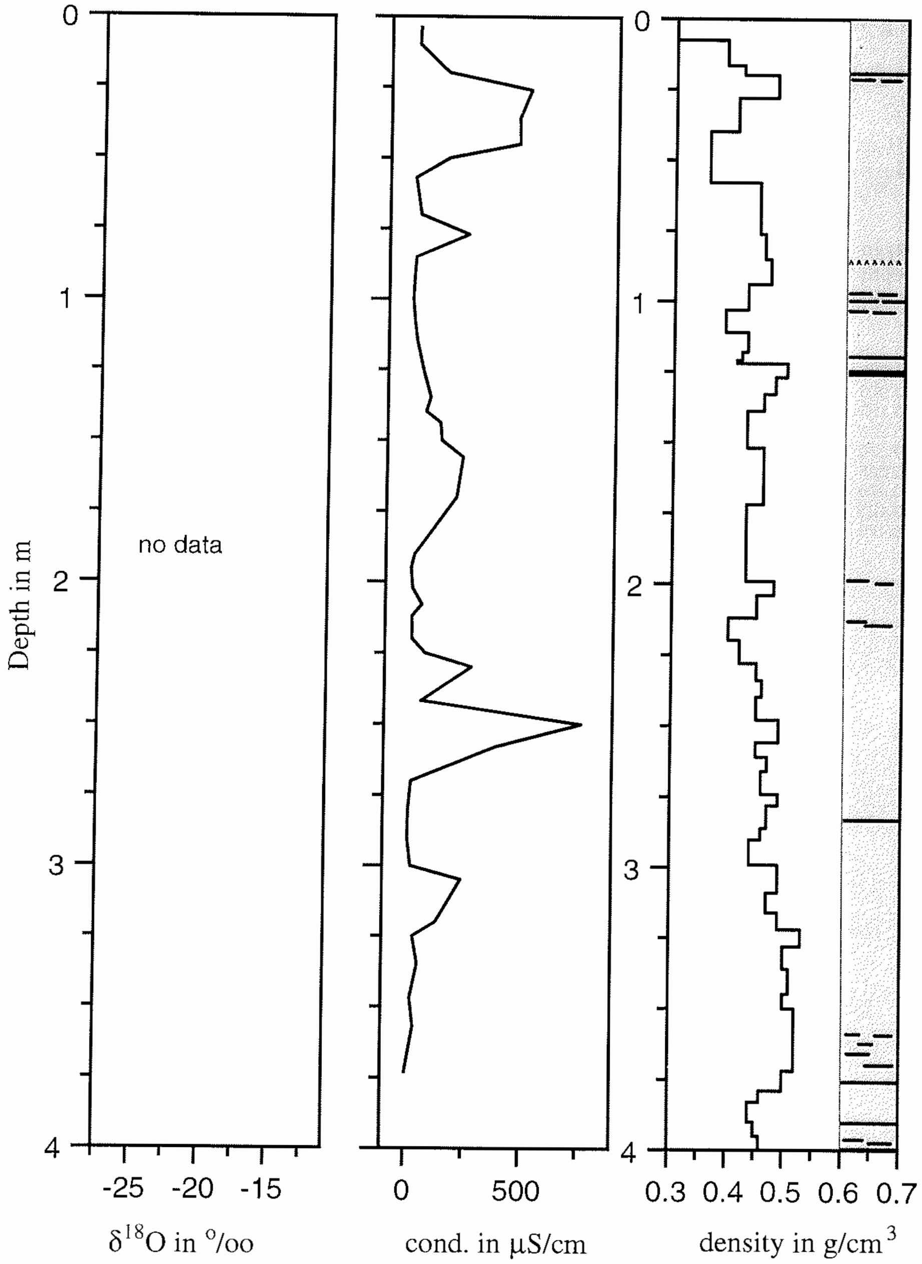
Georg-von-Neumayer Station

70°37'S 8°22'W
19.2.82
4.15m
ssgvn282

Mean Depth [m]	Density [g/cm³]
0.075	0.300
0.165	0.390
0.200	0.420
0.280	0.480
0.395	0.410
0.575	0.360
0.760	0.450
0.850	0.460
0.935	0.470
1.025	0.430
1.100	0.390
1.180	0.430
1.205	0.420
1.220	0.410
1.265	0.500
1.330	0.480
1.390	0.460
1.520	0.430
1.720	0.460
1.835	0.430
1.895	0.430
1.955	0.430
1.985	0.430
2.040	0.480
2.115	0.450
2.205	0.400
2.275	0.420
2.335	0.450
2.400	0.460
2.480	0.450
2.565	0.490
2.615	0.450
2.625	0.470
2.710	0.460
2.740	0.460
2.780	0.490
2.820	0.470
2.840	0.470
2.860	0.470
2.900	C.460
2.990	0.440
3.090	0.490
3.160	0.470
3.220	0.490
3.275	0.530
3.360	0.500
3.450	0.510
3.505	0.500
3.590	0.520
3.660	0.520
3.685	0.520

Mean Depth [m]	Density [g/cm³]
3.720	0.520
3.760	0.500
3.790	0.500
3.383	0.460
3.895	0.440
3.395	0.450
4.005	0.460
4.065	0.480
4.120	0.520

Mean Depth [m]	El. Cond. [µS/cm]
0.040	25.0
0.100	22.0
0.180	125.0
0.200	152.0
0.260	513.0
0.360	462.0
0.450	465.0
0.500	155.0
0.570	10.0
0.700	35.0
0.770	245.0
0.850	15.0
0.920	8.0
1.000	5.0
1.080	12.0
1.150	23.0
1.260	54.0
1.350	85.0
1.400	66.0
1.440	130.0
1.500	135.0
1.560	230.0
1.700	205.0
1.900	25.0
1.950	10.0
2.020	16.0
2.080	58.0
2.120	15.0
2.200	16.0
2.250	74.0
2.300	278.0
2.420	58.0
2.500	762.0
2.580	384.0
2.700	20.0
2.800	8.0
2.900	6.0
3.000	20.0
3.050	240.0
3.200	132.0
3.250	32.0
3.350	55.0
3.470	23.0
3.570	39.0
3.730	5.0



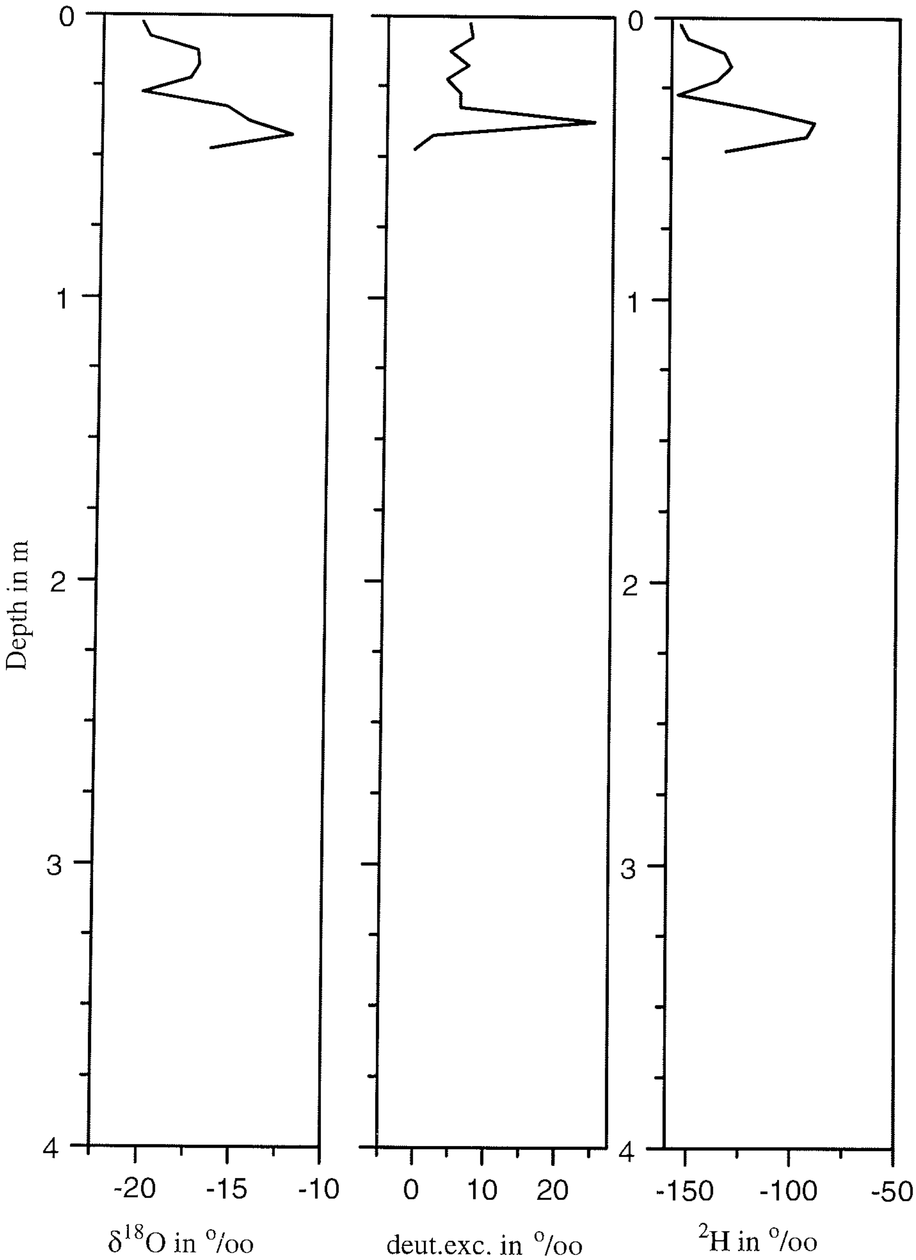
Snow pit, 1.6km south of GvN, 19.2.82 (cont. with core)

The continuation of this pit is core fbgvn0282 (see App.C)

Georg-von-Neumayer Station

70°37'S 8°22'W
7.6.82
0.50m
AS04

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.175	-131.2	-17.24	6.7				
0.025	-155.8	-20.34	6.9				
0.075	-152.2	-19.94	7.3				
0.125	-134.6	-17.34	4.1				
0.225	-138.0	-17.70	3.6				
0.275	-156.9	-20.31	5.6				
0.325	-120.0	-15.70	5.6				
0.375	-91.1	-14.47	24.7				
0.425	-94.9	-12.06	1.6				
0.475	-133.6	-16.58	-1.0				



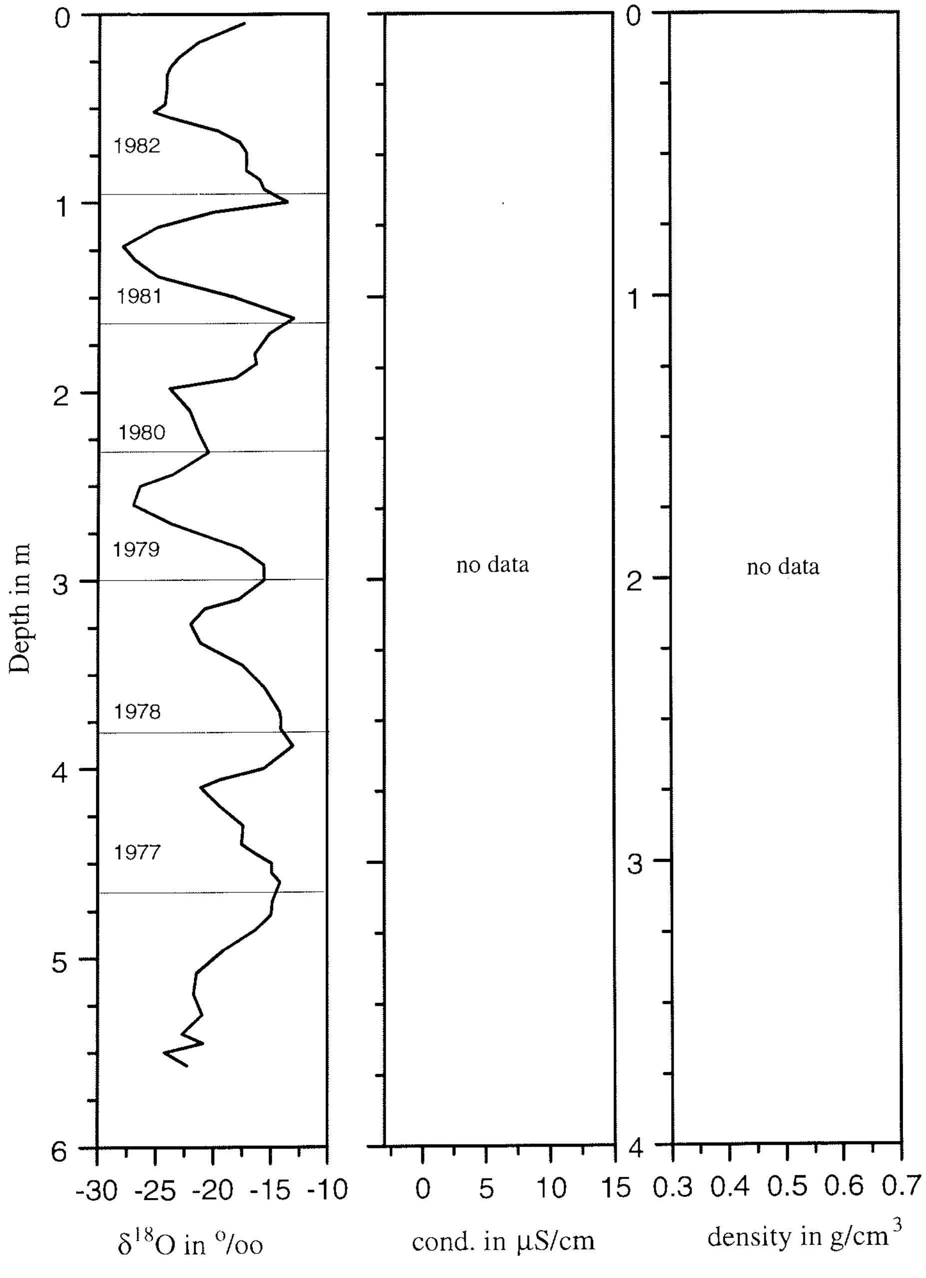
Snow pit, GvN, June 1982

Georg-von-Neumayer Station (7.5km SSW)

70°38'S 8°23'W
4.2.83
5.64m
AS05

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	σ (^3H) [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.050		-17.32					
0.150		-21.33					
0.230		-23.10					
0.280		-23.80					
0.320		-24.10					
0.350		-24.12					
0.390		-24.12					
0.400		-24.13					
0.480		-24.30					
0.520		-25.28					
0.550		-23.85					
0.620		-19.68					
0.680		-17.76					
0.737		-17.11					
0.780		-17.12					
0.830		-17.17					
0.880		-15.97					
0.930		-15.60					
1.000		-13.55					
1.050		-20.05					
1.130		-24.93					
1.230		-27.94					
1.300		-26.91					
1.390		-24.85					
1.500		-18.10					
1.610		-12.98					
1.690		-15.09					
1.800		-16.40					
1.850		-16.25					
1.925		-18.05					
1.980		-23.81					
2.100		-22.05					
2.220		-21.24					
2.320		-20.43					
2.440		-23.59					
2.500		-26.40					
2.600		-26.98					
2.700		-23.64					
2.830		-17.63					
2.920		-15.57					
3.000		-15.52					
3.100		-17.75					
3.150		-20.73					
3.230		-21.94					
3.330		-21.11					
3.450		-17.42					
3.570		-15.48					
3.700		-14.17					
3.740		-14.07					
3.790		-14.08					
3.880		-13.02					
4.000		-15.55					
4.060		-19.46					
4.100		-21.09					
4.200		-19.38					
4.300		-17.39					
4.350		-17.42					

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	σ (^3H) [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
4.400		-17.52					
4.450		-16.28					
4.500		-14.89					
4.550		-14.88					
4.600		-14.16					
4.700		-14.82					
4.770		-14.93					
4.850		-16.30					
4.960		-19.13					
5.450		-20.92					
5.080		-21.46					
5.190		-21.71					
5.300		-20.98					
5.400		-22.71					
5.500		-24.25					
5.570		-22.29					

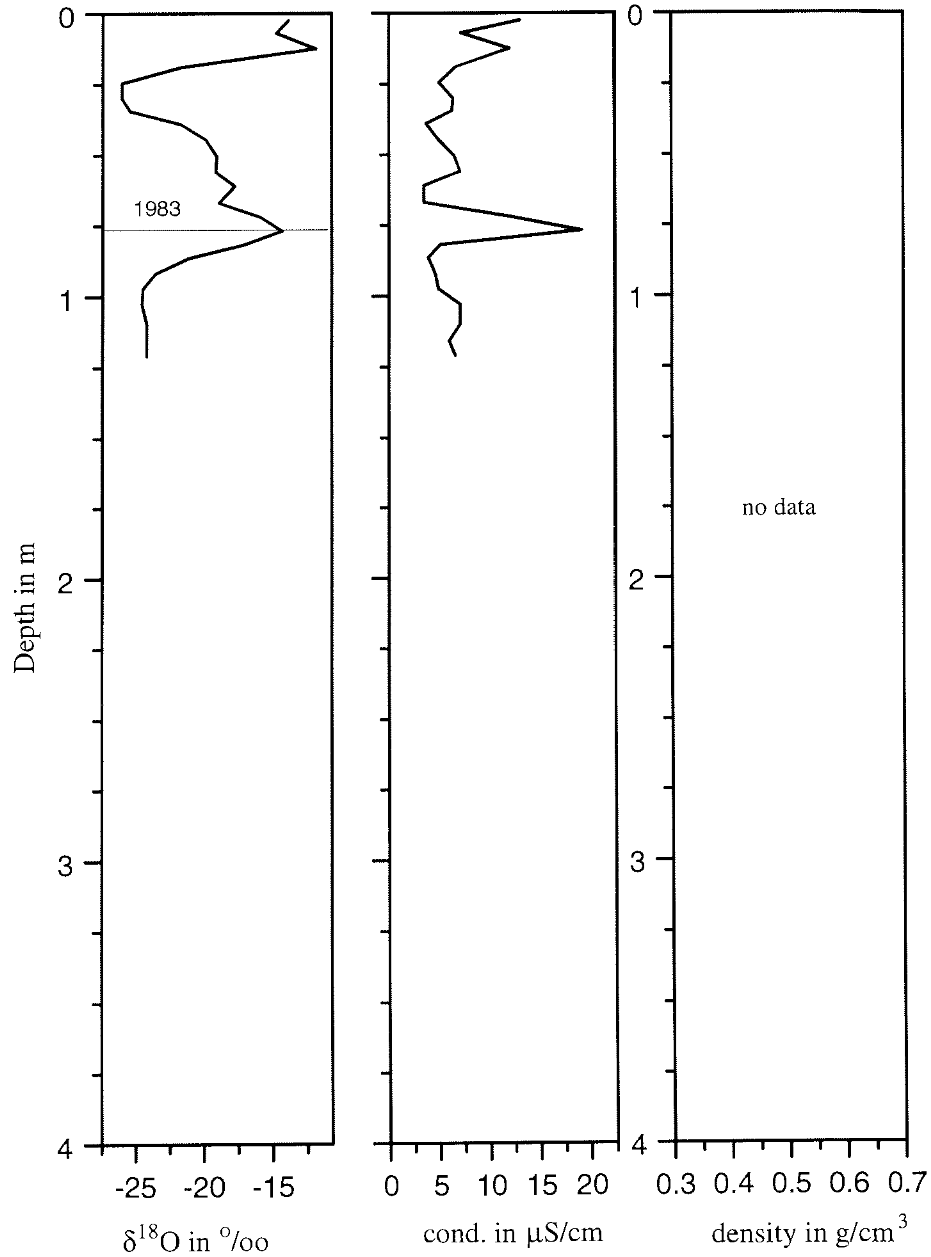


Snow pit, GvN, Feb. 1983

Georg-von-Neumayer Station

70°37'S 8°22'W
26.2.84
1.21m
AS06

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.025		-13.87				13.1	
0.070		-14.73				7.2	
0.125		-11.84				12.1	
0.190		-21.71				6.7	
0.245		-26.08				5.0	
0.300		-26.05				6.4	
0.345		-25.48				6.3	
0.390		-21.72				3.7	
0.445		-19.87				4.9	
0.505		-19.06				6.5	
0.560		-19.16				7.1	
0.610		-17.74				3.5	
0.670		-18.89				3.5	
0.720		-15.89				12.1	
0.770		-14.30				19.2	
0.820		-17.21				5.1	
0.865		-21.17				3.9	
0.920		-23.62				4.6	
0.975		-24.55				4.9	
1.030		-24.60				7.1	
1.100		-24.20				7.1	
1.160		-24.23				6.0	
1.210		-24.20				6.6	



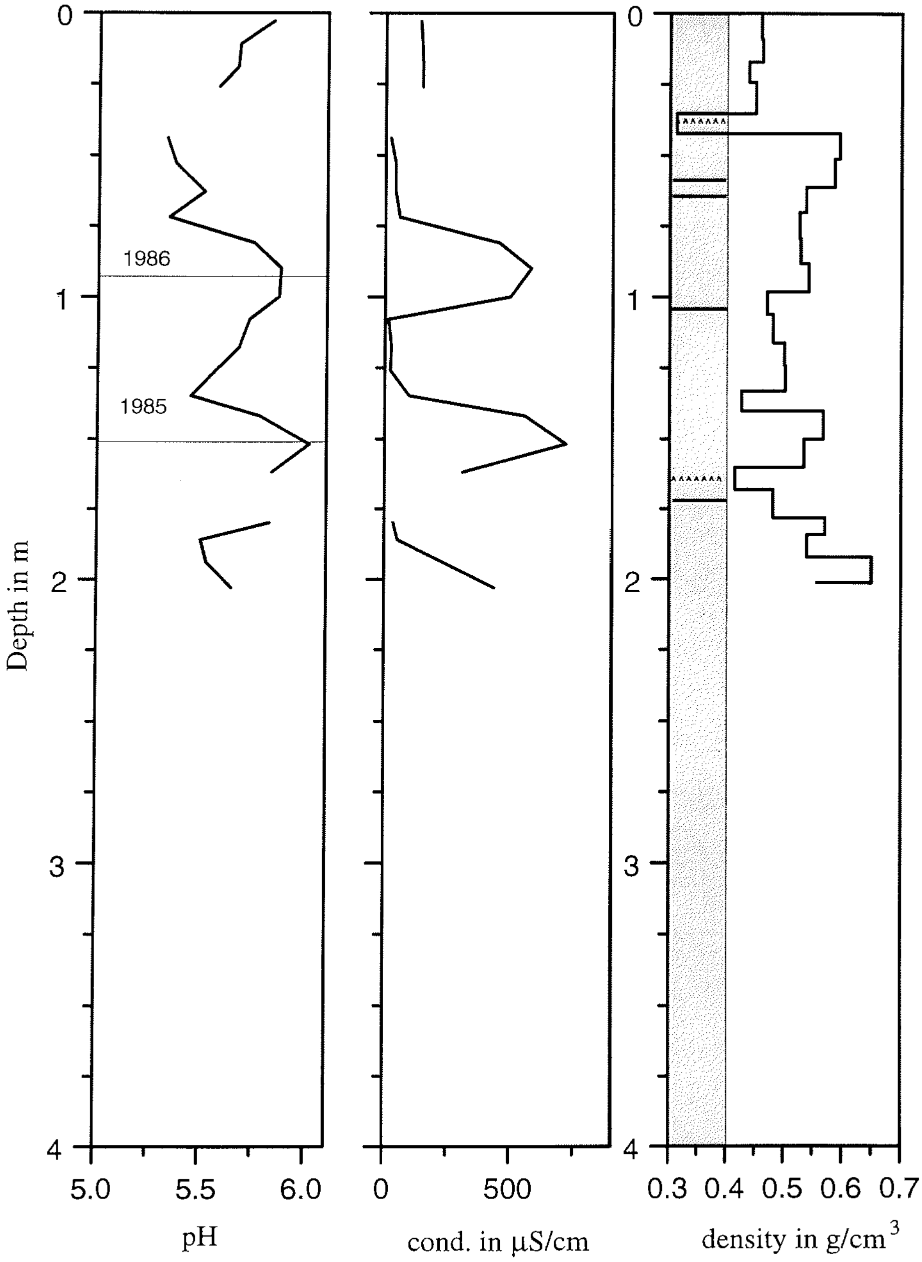
Snow pit, GvN, Feb.1984

Georg-von-Neumayer Station

70°37'S 8°22'W
28.04.87
2.00m
ssgvn0487

Mean Depth [m]	El. Cond. [µS/cm]
0.025	137.0
0.075	136.0
0.125	141.0
0.175	141.0
0.225	129.0
0.275	80.5
0.325	296.0
0.375	74.8
0.425	23.6
0.475	31.9
0.525	46.5
0.575	55.0
0.625	42.0
0.675	64.9
0.725	31.6
0.775	23.9
0.825	29.0
0.875	146.0
0.925	532.0
0.975	326.0

Mean Depth [m,]	Density [g/cm^3]
3	0.462
11	0.464
19	0.440
26	0.452
37	0.312
44	0.598
53	0.589
63	0.540
72	0.528
81	0.530
90	0.544
100	0.472
108	0.482
118	0.502
126	0.504
135	0.428
142	0.570
152	0.536
162	0.416
170	0.482
180	0.573
186	0.541
194	0.650
203	0.558

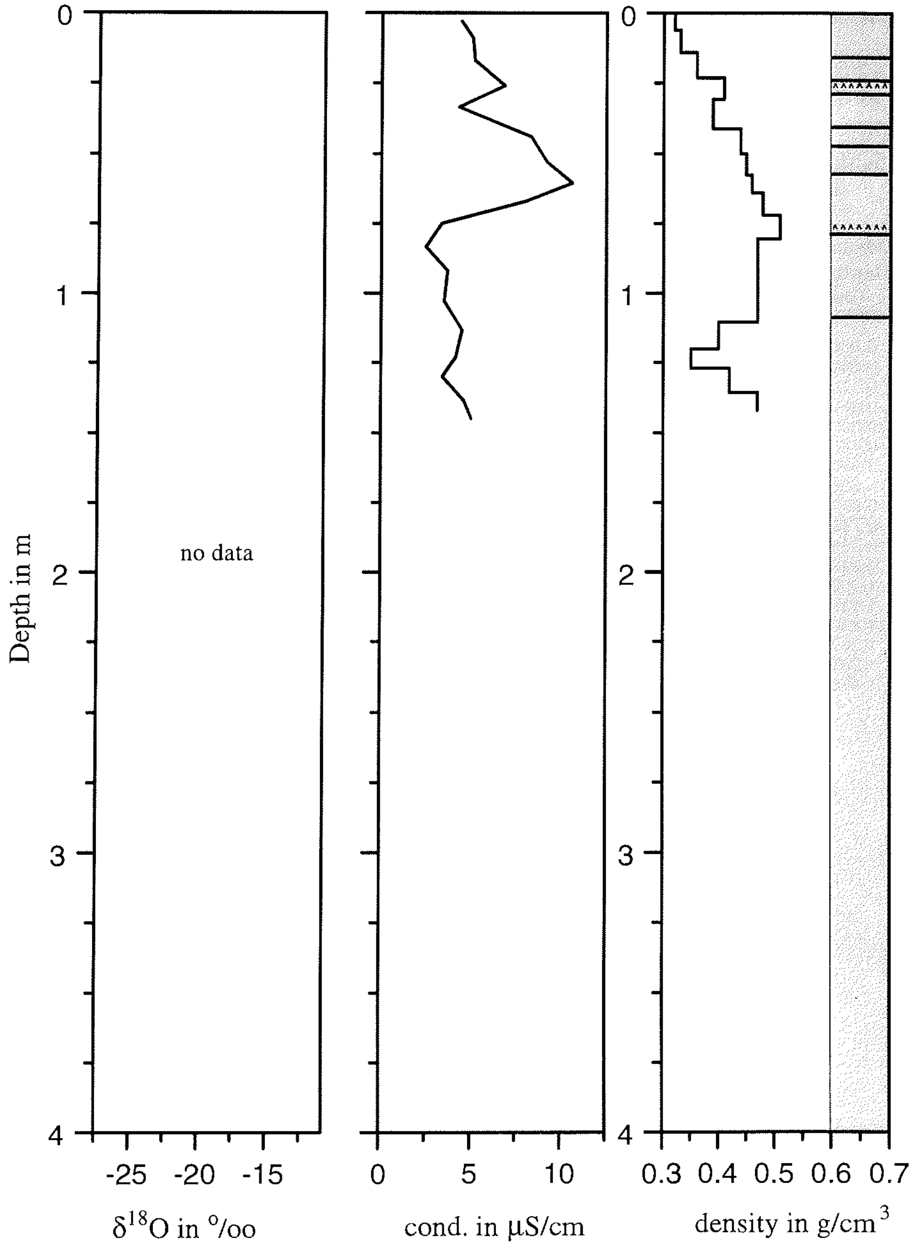


Snow pit, GvN, April 1987

15km South

70°45'S 8°22'W
6.5.87
1.60m
ss15s587

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.030						0.320	4.40
0.090						0.330	5.03
0.170						0.360	5.15
0.260						0.410	6.83
0.335						0.390	4.26
0.440						0.440	8.31
0.530						0.450	9.20
0.605						0.460	10.60
0.670						0.480	8.08
0.750						0.510	3.32
0.835						0.470	2.45
0.920						0.470	3.64
1.030						0.470	3.45
1.135						0.400	4.47
1.230						0.350	4.12
1.300						0.420	3.36
1.385						0.470	4.58
1.450						0.470	5.01

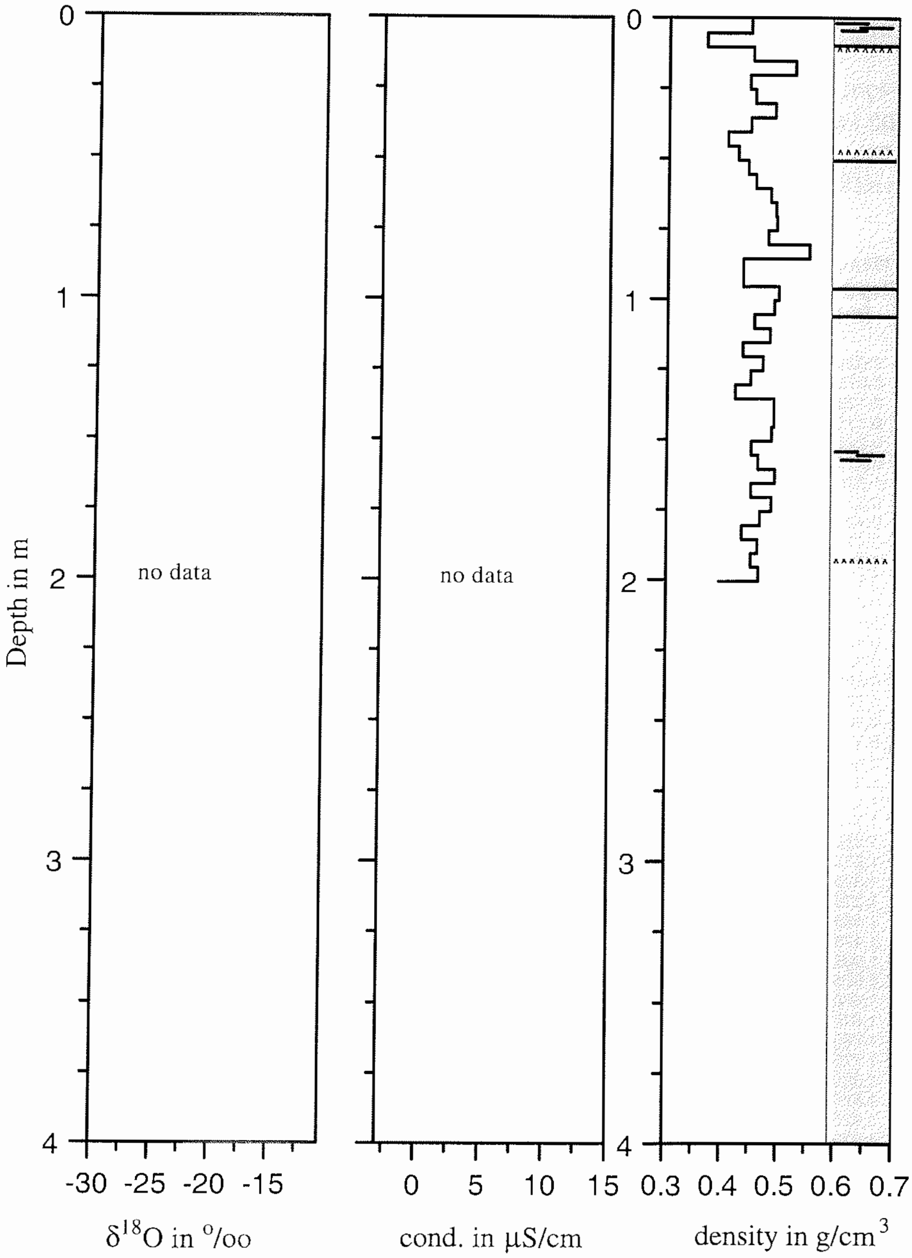


Snow pit, 15km S, May 1987

Georg-von-Neumayer Station

70°37'S 8°22'W
19.02.88
2.05m
ssgvn288

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.025							0.446
0.075							0.367
0.125							0.450
0.175							0.525
0.225							0.444
0.275							0.454
0.325							0.490
0.375							0.446
0.425							0.405
0.475							0.424
0.525							0.442
0.575							0.456
0.625							0.482
0.675							0.492
0.725							0.494
0.775							0.478
0.825							0.552
0.875							0.434
0.925							0.434
0.975							0.498
1.025							0.490
1.075							0.454
1.125							0.482
1.175							0.434
1.225							0.470
1.275							0.448
1.325							0.421
1.375							0.490
1.425							0.490
1.475							0.486
1.525							0.450
1.575							0.462
1.625							0.492
1.675							0.450
1.725							0.486
1.775							0.466
1.825							0.434
1.875							0.462
1.925							0.450
1.975							0.464
2.025							0.394

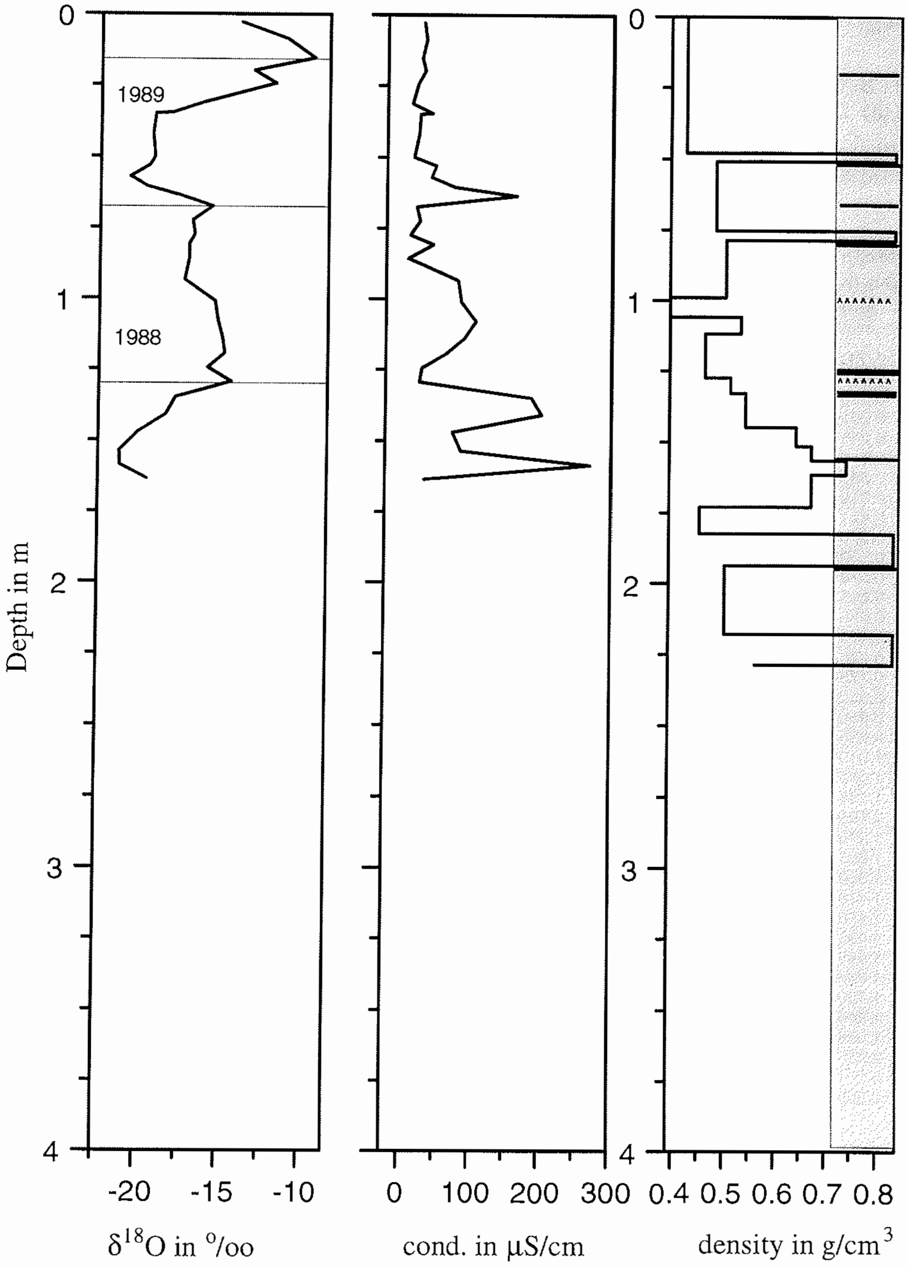


Snow pit, GvN, Feb.1988

Georg-von-Neumayer Station

70°37'S 8°22'W
16.3.90
2.42m
SS160390

Mean Depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	σ(^{3}H) [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
0.030		-13.93				25.9	0.420
0.090		-11.06				29.5	0.420
0.015		-9.41				23.4	0.420
0.200		-13.14				27.9	0.420
0.245		-11.81				18.1	0.420
0.314		-16.33				10.0	0.420
0.349		-18.17				38.5	0.420
0.310		-19.15				21.8	0.420
0.421		-19.32				19.8	0.420
0.500		-19.19				13.2	0.830
0.530		-19.50				44.5	0.480
0.570		-20.68				38.0	0.480
0.605		-19.65				72.8	0.480
0.635		-17.76				163.3	0.480
0.675		-15.63				17.6	0.480
0.725		-16.86				22.4	0.480
0.775		-16.73				8.8	0.830
0.850		-17.06				41.7	0.500
0.855		-17.05				6.2	0.500
0.935		-17.32				77.7	0.500
1.010		-15.44				82.5	0.390
1.080		-15.24				104.6	0.530
1.140		-14.97				87.8	0.460
1.195		-14.81				61.0	0.460
1.245		-15.87				26.7	0.460
1.295		-14.38				23.3	0.510
1.350		-17.81				186.1	0.540
1.410		-18.38				201.0	0.540
1.470		-20.06				71.2	0.640
1.535		-21.21				83.2	0.670
1.585		-21.17				270.0	0.740
1.635		-19.51				31.1	0.670
1.750							0.450
1.845							0.830
1.958							0.500
2.235							0.500
2.201							0.830
2.309							0.560

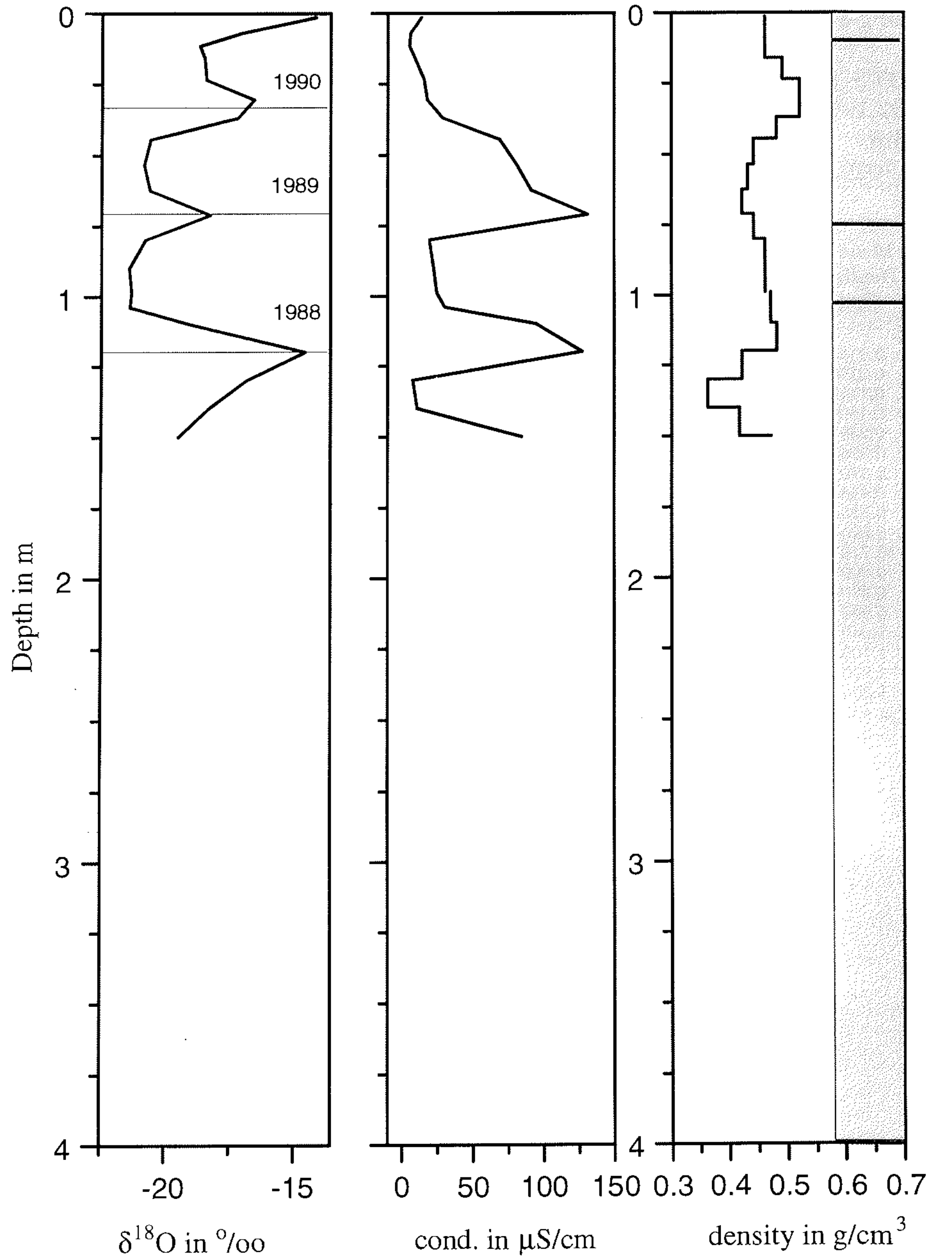


Snow pit, GvN, March 1990

Georg-von-Neumayer Station

70°37'S 8°22'W
14.02.1991
1.55m
SS130291

Mean Depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^{3}]
0.015		-14.14				13.6	0.464
0.070		-17.03				5.9	0.464
0.115		-18.66				5.3	0.464
0.160		-18.47				9.2	0.464
0.235		-18.40				15.6	0.524
0.305		-16.54				17.7	0.524
0.370		-17.19				28.6	0.524
0.445		-20.59				68.7	0.444
0.535		-20.84				80.7	0.444
0.625		-20.61				90.8	0.424
0.710		-18.23				131.0	0.424
0.800		-20.79				19.3	0.464
0.900		-21.41				22.3	0.464
0.990		-21.32				24.6	0.464
1.040		-21.38				30.1	0.830
1.100		-19.04				94.3	0.484
1.200		-14.54				127.2	0.484
1.300		-16.83				7.6	0.364
1.400		-18.30				10.7	0.364
1.500		-19.50				84.3	0.474

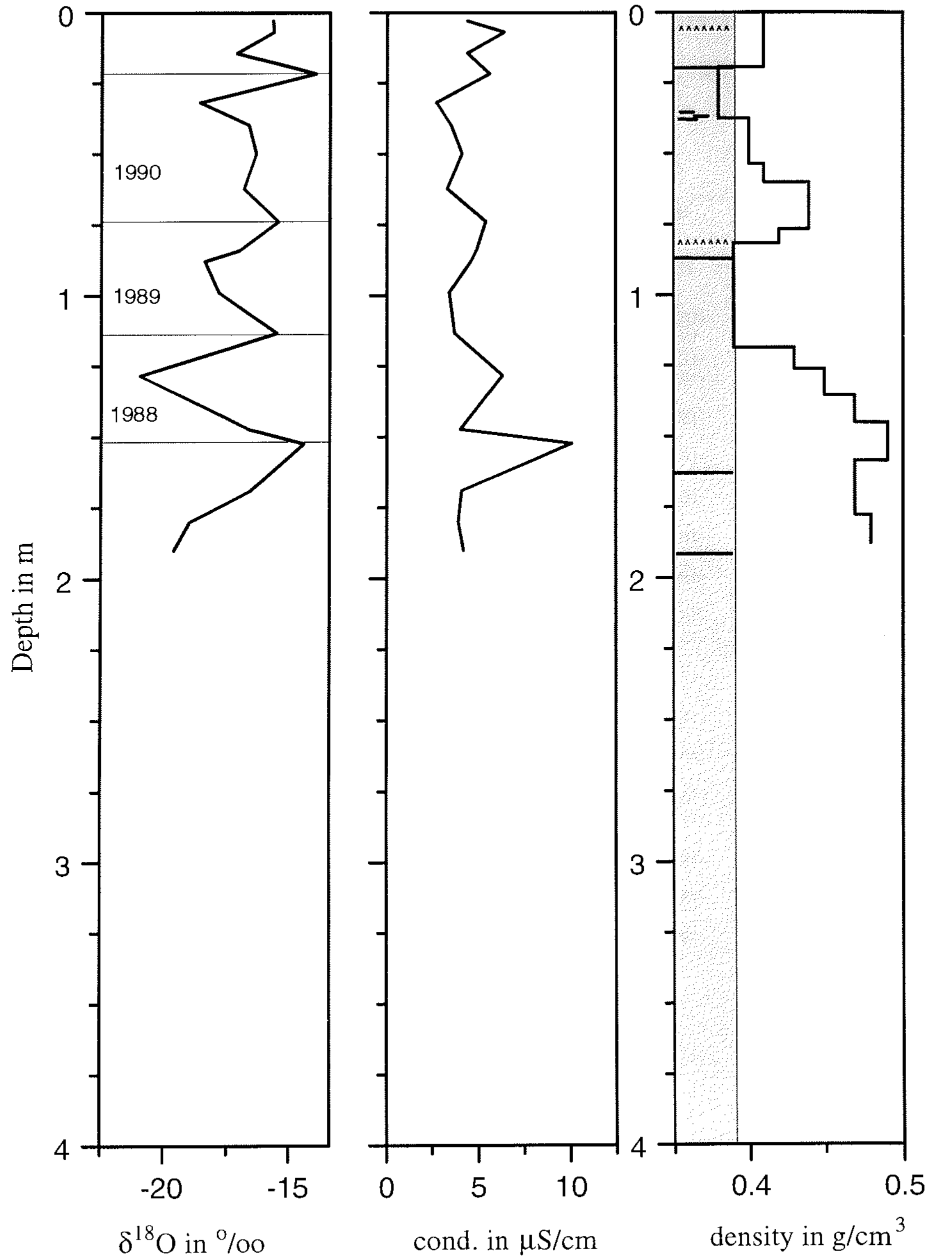


Snow pit, GvN, Feb. 1991

Watzmann (Halvfarryggen)

70°55'32"S 7°23'35"W
9.2.91
1.90m
sshr0291

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.030		-15.67				4.4	0.410
0.070		-15.64				6.4	0.410
0.145		-17.13				4.4	0.410
0.218		-13.92				5.6	0.380
0.263							0.380
0.320		-18.60				2.7	0.380
0.360							0.380
0.400		-16.63				3.5	0.400
0.450							0.400
0.500		-16.34				4.1	0.400
0.560							0.410
0.625		-16.83				3.3	0.440
0.685							0.440
0.740		-15.45				5.4	0.440
0.790							0.420
0.840		-16.98				4.9	0.390
0.880		-18.39				4.6	0.390
0.935							0.390
0.990		-17.82				3.4	0.390
1.060							0.390
1.135		-15.50				3.7	0.390
1.210							0.430
1.285		-20.94				6.3	0.450
1.380							0.470
1.475		-16.59				4.0	0.490
1.525		-14.40				10.1	0.490
1.610							0.470
1.690		-16.55				4.1	0.470
1.745							0.470
1.800		-18.97				3.9	0.480
1.850							0.480
1.900		-19.58				4.2	0.480

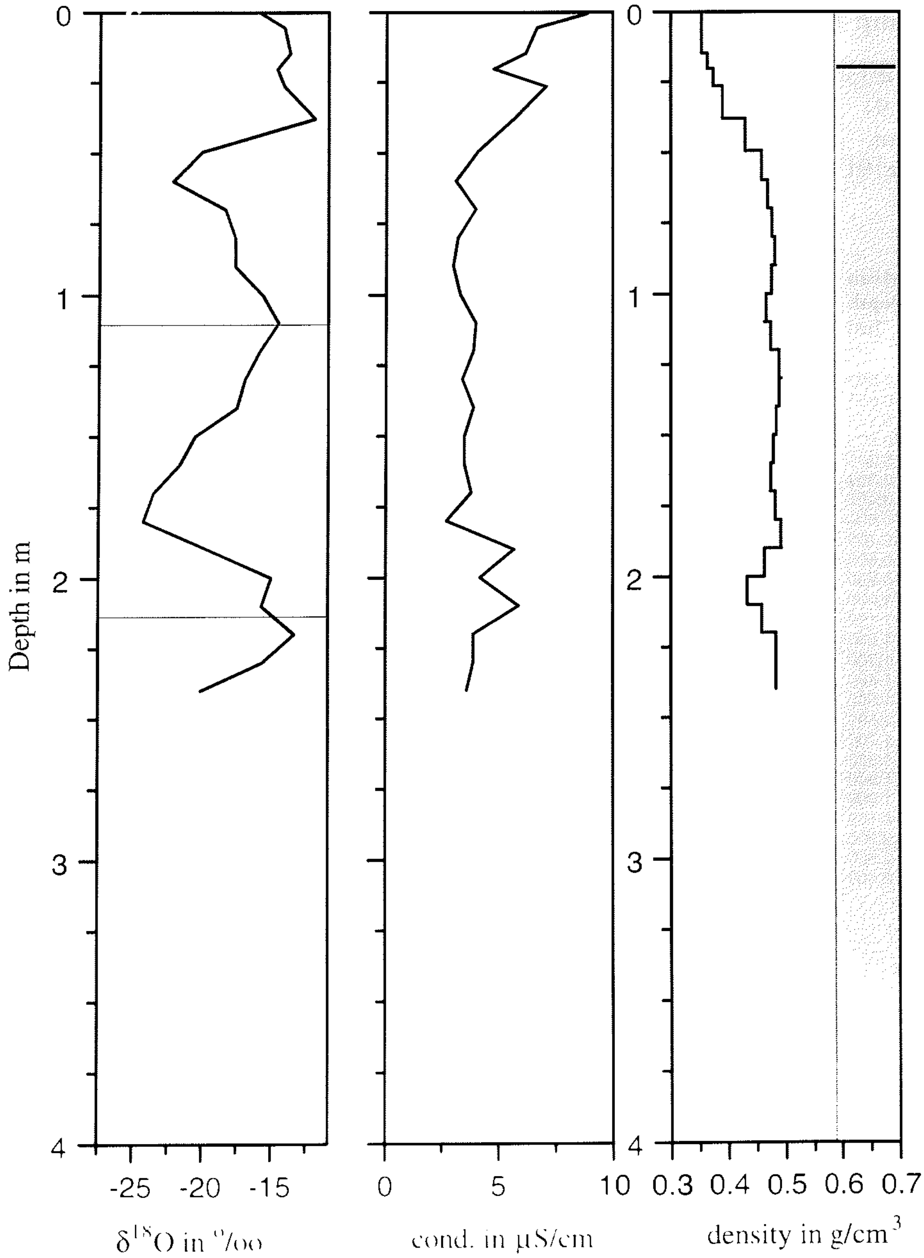


Snow pit, Halvfarryggen, Feb.1991

Olymp (Søråsen)

71°14'35"S 9°40'11"W
28.1.91
2.40m
sssoe191

Mean Depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.005		-15.74				8.9	0.354
0.055		-14.06				6.7	0.354
0.148		-13.64				6.2	0.354
0.203		-14.58				4.8	0.374
0.265		-14.04				7.1	0.374
0.380		-11.85				5.7	0.407
0.495		-20.04				4.1	0.454
0.600		-22.18				3.1	0.466
0.700		-18.36				4.0	0.474
0.800		-17.64				3.2	0.481
0.900		-17.62				3.0	0.484
1.000		-15.61				3.3	0.470
1.100		-14.45				4.0	0.464
1.200		-15.82				3.9	0.486
1.300		-16.90				3.4	0.494
1.400		-17.49				3.9	0.486
1.500		-20.53				3.5	0.484
1.600		-21.63				3.5	0.476
1.700		-23.53				3.8	0.474
1.800		-24.26				2.7	0.491
1.900		-19.56				5.7	0.494
2.000		-14.96				4.2	0.434
2.100		-15.67				5.9	0.434
2.200		-13.29				3.9	0.484
2.300		-15.59				3.9	0.484
2.400		-20.09				3.6	0.484



Snow pit, Sørasen, Jan. 1991

APPENDIX C

Shallow firn cores

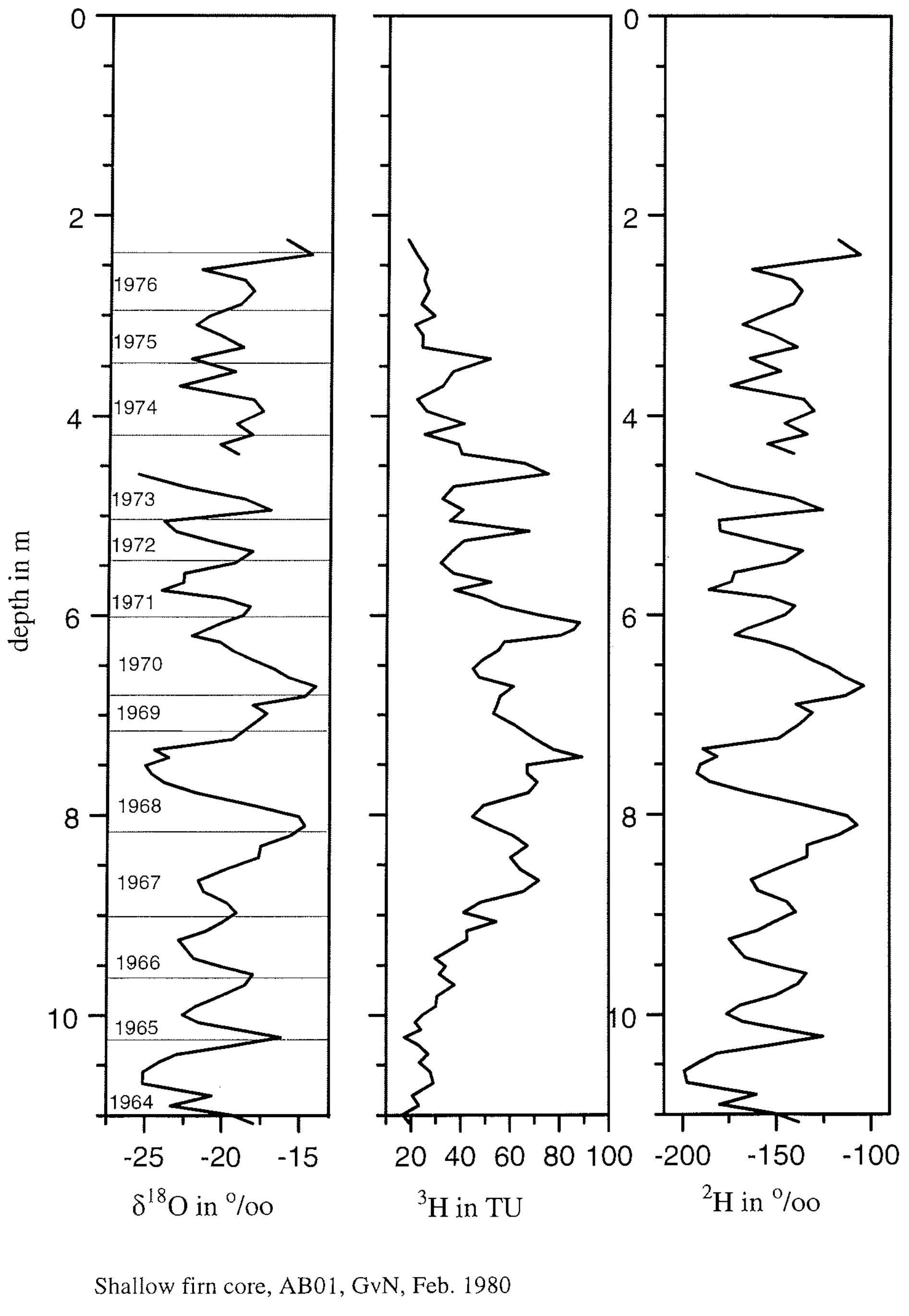
Georg-von-Neumayer Station

70°37'S 8°22'W
Feb.80
12.1m
AB01

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
2.250	-118.0	-15.98	9.8	17.9	±2.1		0.475
2.395	-106.3	-14.37	8.7	21.4	±2.5		0.477
2.545	-162.5	-21.57	10.1	25.5	±2.5		0.479
2.650	-141.4	-18.73	8.4	24.4	±2.5		0.481
2.760	-136.1	-18.13	8.9	26.3	±3.0		0.483
2.890	-140.6	-18.98	11.2	23.3	±4.4		0.485
3.005	-156.5	-21.05	11.9	28.8	±3.7		0.486
3.095	-167.4	-21.91	7.9	20.8	±3.8		0.488
3.200	-151.3	-20.27	10.9	24.0	±3.4		0.489
3.315	-138.6	-18.80	11.8	23.8	±3.9		0.491
3.430	-163.4	-22.20	14.2	51.4	±4.3		0.493
3.555	-147.3	-19.32	7.3	36.3	±3.5		0.495
3.700	-173.8	-22.98	10.0	32.2	±3.2		0.497
3.835	-135.2	-18.11	9.7	21.7	±2.7		0.499
3.955	-129.8	-17.46	9.9	25.6	±3.4		0.501
4.080	-145.0	-19.20	8.6	40.9	±3.9		0.503
4.190	-133.4	-18.17	12.0	25.0	±3.2		0.505
4.290	-154.2	-20.26	7.9	38.6	±3.6		0.506
4.385	-140.3	-19.08	12.3	40.0	±3.8		0.508
4.480				65.7	±4.8		0.509
4.585	-192.3	-25.60	12.5	75.2	±5.8		0.511
4.710	-173.6	-22.61	7.3	36.6	±3.6		0.513
4.835	-140.5	-18.64	8.6	32.2	±3.2		0.514
4.945	-125.5	-16.94	10.0	40.6	±3.7		0.516
5.055	-180.0	-23.94	11.5	35.4	±3.7		0.519
5.160	-179.4	-23.15	5.8	67.4	±5.4		0.518
5.255	-159.1	-20.93	8.3	41.0	±3.7		0.496
5.360	-135.7	-18.13	9.3	36.1	±3.5		0.497
5.475	-144.6	-19.26	9.5	31.6	±3.8		0.498
5.580	-171.6	-22.61	9.3	36.7	±3.3		0.500
5.670	-173.2	-22.64	7.9	52.0	±4.3		0.501
5.750	-185.4	-24.04	6.9	37.3	±3.3		0.502
5.830	-152.1	-19.97	7.7	48.9	±4.0		0.503
5.915	-139.6	-18.24	6.3	56.6	±4.5		0.504
6.000	-144.4	-18.72	5.4	72.0	±6.2		0.505
6.075	-155.0	-20.13	6.0	88.0	±6.4		0.506
6.140	-165.0	-21.14	4.1	86.0	±6.3		0.507
6.200	-171.3	-22.06	5.2	80.5	±6.3		0.507
6.265	-155.3	-20.19	6.2	57.6	±4.6		0.510
6.350	-140.6	-19.36	14.3	55.2	±4.4		0.509
6.445	-131.1	-18.02	13.1	48.7	±4.0		0.510
6.535	-121.3	-16.68	12.1	44.9	±4.0		0.511
6.620	-114.1	-15.75	11.9	47.4	±3.8		0.512
6.710	-103.9	-13.99	8.0	61.3	±4.5		0.514
6.810	-113.6	-14.72	4.2	55.9	±4.6		0.515
6.900	-138.9	-18.04	5.4	54.7	±5.7		0.516
6.985	-130.4	-17.15	6.8	53.2	±4.2		0.517
7.105	-137.5	-18.17	7.9	62.0	±4.8		0.518
7.245	-148.3	-19.38	6.7	70.2	±5.4		0.520
7.350	-188.7	-24.49	7.2	77.5	±5.9		0.521
7.425	-181.0	-23.54	7.3	88.8	±6.9		0.522
7.505	-190.1	-25.05	10.3	66.8	±5.6		0.523
7.590	-191.9	-24.64	5.2	67.0	±5.2		0.524
7.675	-185.0	-23.86	5.9	71.0	±5.6		0.525
7.780	-165.5	-21.73	8.3	67.5	±5.5		0.527
7.910	-134.6	-17.85	8.2	49.1	±4.3		0.528

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm³]
8.020	-112.8	-15.07	7.8	44.7	±3.7		0.531
8.110	-107.3	-14.68	10.1	52.0	±5.5		0.532
8.205	-117.1	-15.58	7.5	61.0	±5.2		0.533
8.310	-133.3	-17.51	6.8	67.0	±5.7		0.534
8.425	-133.3	-17.67	8.1	60.2	±5.0		0.536
8.540	-148.7	-19.79	9.6	64.1	±4.9		0.537
8.655	-162.8	-21.60	10.0	71.7	±6.2		0.539
8.765	-159.3	-21.23	10.5	65.5	±5.6		0.540
8.875	-144.0	-19.73	13.8	47.9	±3.9		0.541
8.975	-139.4	-19.09	13.3	41.2	±3.5		0.542
9.065	-149.7	-19.96	10.0	54.3	±4.5		0.543
9.155	-159.0	-21.06	9.5	42.4	±3.8		0.544
9.245	-174.6	-22.86	8.3	42.6	±3.8		0.530
9.430	-166.2	-21.85	8.6	29.7	±2.9		0.547
9.510	-151.4	-20.06	9.1	33.9	±3.0		0.548
9.590	-134.0	-18.00	10.0	31.4	±2.9		0.549
9.695	-138.6	-18.51	9.5	37.5	±3.3		0.550
9.810	-150.3	-20.16	11.0	30.5	±3.0		0.551
9.910	-169.1	-21.75	4.9	30.0	±3.6		0.553
9.995	-176.1	-22.59	4.6	24.9	±2.6		0.554
10.070	-167.8	-21.54	4.5	21.6	±2.5		0.555
10.145	-147.4	-18.82	3.2	24.0	±2.7		0.555
10.220	-125.3	-16.20	4.3	17.4	±1.4		0.556
10.305	-151.4	-19.40	3.8	23.3	±3.3		0.557
10.390	-181.1	-22.96	2.6	26.9	±3.1		0.558
10.475	-190.4	-24.20	3.2	23.4	±2.7		0.560
10.565	-199.1	-25.12	1.9	27.7	±2.9		0.561
10.680	-197.5	-25.13	3.5	29.0	±2.8		0.562
10.805	-160.4	-20.67	5.0	20.6	±2.6		0.564
10.905	-179.7	-23.33	6.9	23.2	±2.7		0.565
10.995	-150.6	-19.33	4.0	16.7	±2.2		0.566
11.080	-138.2	-17.96	5.5	19.4	±2.4		0.567
11.160	-158.4	-20.64	6.7	23.2	±2.5		0.568
11.245	-191.7	-24.76	6.4	31.4	±3.6		0.569
11.340	-215.9	-27.49	4.0	27.8	±3.2		0.574
11.510	-155.5	-20.03	4.7	53.0	±4.4		0.572
11.590	-166.5	-21.40	4.7	19.9	±3.0		0.573
11.670	-158.6	-20.83	8.0	22.6	±0.2		0.570
11.750	-155.9	-20.23	5.9	23.8	±3.1		0.575
11.830	-150.5	-19.53	5.7	17.6	±5.7		0.576
11.905	-146.1	-19.17	7.3	18.1	±2.6		0.577
11.980	-161.9	-21.10	6.9	23.8	±2.8		0.578
12.060	-151.2	-19.76	6.9	18.9	±2.3		0.579

Year	Layer thickness [m]	mean ^{18}O [‰]	mean ^2H [‰]	mean ^3H [TU]	annual accumulation [mm w.e.]
1979	0.504	-21.38	-160.7	22.5	224
1978	0.715	-17.86	-132.6	18.0	324
1977	1.008	-18.48	-139.0	20.6	470
1976	0.561	-17.47	-130.7	23.5	268
1975	0.560	-20.05	-149.6	24.3	273
1974	0.743	-20.02	-150.3	34.3	370
1973	0.798	-20.71	-155.8	44.4	407
1972	0.448	-21.04	-159.3	44.8	229
1971	0.547	-20.98	-159.6	41.3	273
1970	0.784	-18.63	-140.0	61.9	399
1969	0.420	-16.48	-125.5	57.2	217
1968	0.981	-20.91	-159.6	64.9	514
1967	0.812	-18.75	-140.5	62.2	435
1966	0.757	-20.30	-152.5	39.8	412
1965	0.546	-20.27	-155.8	28.0	302
1964	0.869	-22.06	-172.5	23.5	488
1963	0.700	-22.17	-171.6	28.3	400



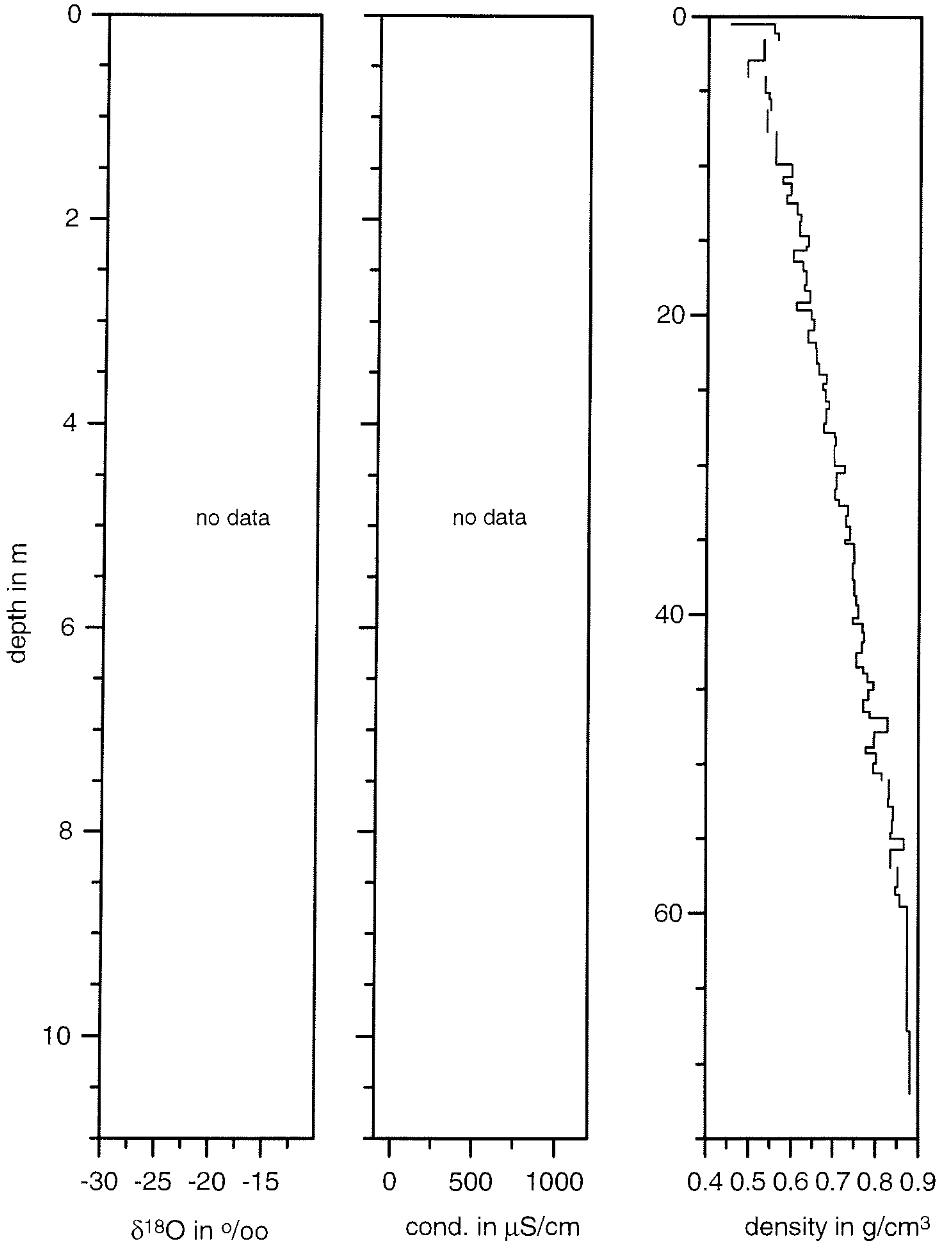
Shallow firn core, AB01, GvN, Feb. 1980

Georg-von-Neumayer Station

70°37'S 8°22'W
13./17.1.82
68.0m
B03

Mean Depth [m]	Density [g/cm³]
0.524	0.454
1.155	0.556
1.574	0.565
2.587	
2.962	0.531
4.086	0.493
4.480	
5.153	0.534
5.556	0.543
6.315	0.547
6.935	
7.756	0.539
8.175	
8.815	
9.408	0.561
9.905	0.559
10.725	0.598
11.167	0.577
11.960	0.596
12.505	0.586
13.262	0.611
13.735	0.620
14.702	0.617
15.435	0.638
15.693	0.632
16.442	0.601
17.058	0.625
17.964	0.632
18.370	0.628
19.174	0.641
19.675	0.609
20.278	0.644
21.006	0.652
21.853	0.637
22.234	0.656
23.234	0.657
23.970	0.663
24.582	0.682
25.009	0.673
25.765	0.679
26.257	0.689
27.205	0.681
27.816	0.676
28.130	0.704
28.654	0.708
29.635	0.703
30.022	0.704
30.497	0.729
31.604	0.709
32.289	0.705
32.676	0.716
33.361	0.737
34.094	0.732
35.000	0.742
35.253	0.730
35.733	0.751
36.570	0.752
36.960	0.748
37.693	0.747
38.320	0.752

Mean Depth [m]	Density [g/cm³]
38.733	0.752
39.368	0.756
40.236	0.761
40.629	0.748
41.206	0.770
41.860	0.774
42.573	0.769
43.538	0.757
43.952	0.772
44.528	0.782
45.045	0.795
45.710	0.784
46.518	0.772
46.903	0.787
47.844	0.828
48.185	0.797
48.865	0.796
49.249	0.778
49.940	0.801
50.602	0.795
51.055	0.815
51.700	
52.320	0.832
52.840	0.829
53.764	0.841
54.618	0.839
55.005	0.835
55.755	0.866
56.942	0.835
57.680	
58.228	0.852
58.765	0.846
59.554	0.857
67.818	0.875



Shallow firn core B03, Georg-von-Neumayer Station, January 1982
(after Dörr, 1984)

Georg-von-Neumayer Station

70°37'S 8°22'W
Feb.82
52m
B04

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.025	-144.4	-18.5	3.8	11.6	±2.4	280	0.440
0.076	-148.2	-19.0	3.7	11.6	±2.4	137.5	0.441
0.127	-146.2	-18.9	4.9	11.6	±2.4	290	0.442
0.178	-148.5	-19.5	7.7	11.6	±2.4	353	0.443
0.228	-160.1	-21.0	8.0	13.8	±4.3	353.1	0.444
0.279	-164.3	-21.5	7.3	13.8	±4.3	187.8	0.444
0.330	-179.7	-22.9	3.4	13.8	±4.3	1779	0.445
0.381	-192.7	-24.8	5.4	13.8	±4.3	2140	0.446
0.432	-196.2	-25.2	5.4	11.5	±3.2	2440	0.447
0.482	-189.7	-24.5	6.4	11.5	±3.2	1724	0.447
0.533	-168.4	-22.0	7.6	11.5	±3.2	731	0.448
0.584	-139.2	-17.9	4.2	11.5	±3.2	105	0.449
0.635	-130.1	-17.0	5.7	14.5	±5.6	242	0.450
0.685	-109.5	-14.2	4.0	14.5	±5.6	633	0.451
0.735	-118.1	-15.3	4.6	14.5	±5.6	2180	0.451
0.785	-132.3	-17.2	5.1	14.5	±5.6	1283	0.452
0.835	-148.1	-19.2	5.5	20.6	±2.7	1099	0.453
0.885	-155.6	-20.5	8.1	20.6	±2.7	765	0.454
0.935	-160.7	-21.0	7.2	20.6	±2.7	642	0.454
0.985	-162.9	-21.2	6.9	20.6	±2.7	579	0.455
1.035	-160.2	-20.9	7.2	16.3	±2.9	600	0.456
1.085	-153.6	-20.2	8.0	16.3	±2.9	672	0.457
1.135	-150.0	-19.7	7.7	16.3	±2.9	2560	0.457
1.185	-153.4	-20.4	9.7	16.3	±2.9	2820	0.458
1.235	-149.5	-19.4	5.3	16.3	±3.2	550	0.459
1.285	-136.5	-17.8	6.1	16.3	±3.2	142.9	0.460
1.320	-133.6	-17.5	6.3	16.3	±3.2	188.1	0.460
1.356	-120.1	-16.4	11.3	16.3	±3.2	215	0.461
1.407	-127.6	-16.2	1.7	17.8	±2.7	220	0.462
1.458	-123.8	-16.7	10.0	17.8	±2.7	295	0.462
1.509	-124.2	-17.0	12.0	17.8	±2.7	427	0.463
1.560	-122.9	-16.3	7.5	17.8	±2.7	493	0.464
1.611	-119.4	-15.0	0.3	13.8	±2.8	307	0.465
1.662	-111.9	-14.6	4.8	13.8	±2.8	222	0.466
1.713	-117.3	-15.5	6.4	13.8	±2.8	490	0.466
1.764	-117.2	-15.6	7.4	13.8	±2.8	606	0.467
1.815	-113.0	-15.6	12.1	14.7	±3.9	886	0.468
1.865	-123.8	-16.7	9.6	14.7	±3.9	890	0.469
1.915	-127.9	-17.2	9.9	14.7	±3.9	2680	0.469
1.965	-137.4	-18.3	9.1	14.7	±3.9	2370	0.470
2.015	-154.3	-19.5	2.0	21.0	±4.3	592	0.471
2.065	-156.2	-20.1	4.5	21.0	±4.3	592	0.472
2.116	-176.8	-22.9	6.1	21.0	±4.3	395	0.473
2.169	-190.5	-24.4	4.7	21.0	±4.3	528	0.473
2.221	-199.6			31.5	±3.6	470	0.474
2.274	-202.3	-26.1	6.8	31.5	±3.6	533	0.475
2.326	-203.7	-26.1	5.3	31.5	±3.6	622	0.476
2.379	-209.4	-27.2	8.0	31.5	±3.6	567	0.477
2.431	-208.5	-26.9	6.3	26.4	±4.6	600	0.477
2.484	-205.3	-26.5	6.4	26.4	±4.6	604	0.478
2.535	-170.7	-22.3	7.7	15.2	±3.5	740	0.479
2.585	-158.7	-21.9	16.3	15.2	±3.5	914	0.480
2.635	-146.9	-19.7	10.9	15.2	±3.5	2350	0.481
2.685	-130.1	-17.3	8.0	15.2	±3.5	5770	0.481
2.735	-117.5	-15.7	8.0	14.7	±3.3	5110	0.482

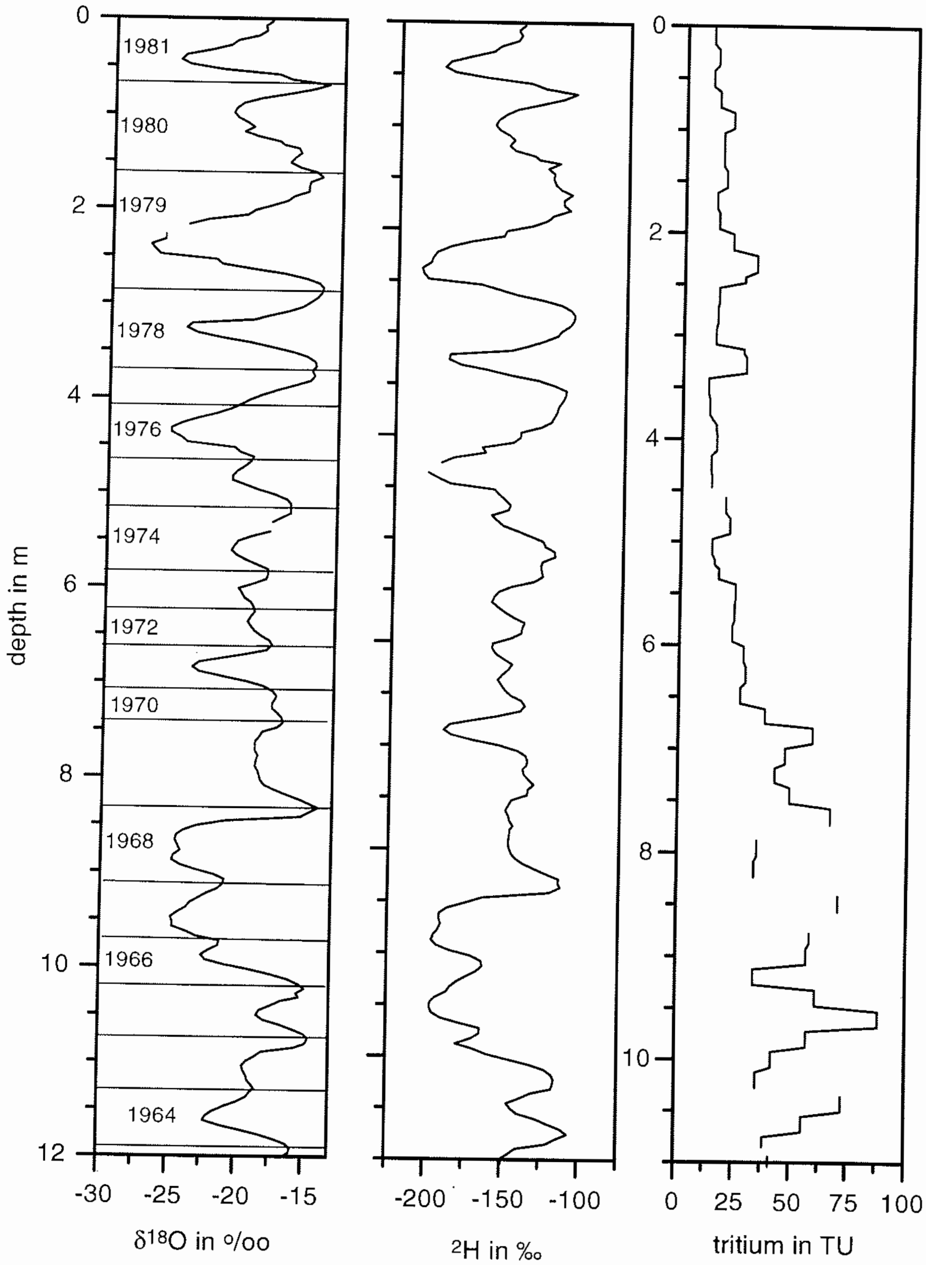
Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
2.785	-111.2	-14.7	6.3	14.7	±3.3	552	0.483
2.835	-108.7	-14.4	6.7	14.7	±3.3	612	0.484
2.885	-109.4	-14.5	6.4	14.7	±3.3	561	0.484
2.935	-111.7	-14.8	6.6	14.2	±3.6	554	0.485
2.985	-117.3	-15.3	4.9	14.2	±3.6	569	0.486
3.035	-120.0	-15.9	7.5	14.2	±3.6	547	0.487
3.085	-129.1	-16.9	6.3	14.2	±3.6	276	0.487
3.135	-139.0	-18.4	8.1	26.4	±4.6	229	0.488
3.175	-150.2	-19.4	5.2	26.4	±4.6	162.4	0.489
3.215	-189.5	-24.0	2.6	27.5	±3.3	221	0.489
3.265	-190.7	-24.4	4.3	27.5	±3.3		0.490
3.315	-182.5	-23.6	6.2	27.5	±3.3	224	0.491
3.365	-165.5	-21.8	9.0	27.5	±3.3	435	0.492
3.415	-149.7	-19.8	8.9	11.2	±3.4	992	0.493
3.465	-131.8	-18.1	12.8	11.2	±3.4	982	0.493
3.515	-120.8	-16.5	11.0	11.2	±3.4	1476	0.494
3.565	-113.4	-15.5	10.9	11.2	±3.4	624	0.495
3.615	-114.1	-14.9	5.3	11.8	±2.4	616	0.496
3.665	-115.8	-14.8	2.2	11.8	±2.4	623	0.496
3.715	-118.3	-15.1	2.8	11.8	±2.4	327	0.497
3.765	-119.4	-14.9	-0.4	11.8	±2.4	388	0.498
3.815	-121.1	-15.2	0.8	13.1	±2.3	296	0.499
3.865	-123.0	-16.4	7.9	14.8	±2.5	107	0.499
3.915	-129.7	-17.6	11.1	14.8	±2.5	128	0.500
3.965	-142.7	-18.7	6.9	15.2	±2.3	217	0.501
4.015	-142.8	-19.6	13.8	15.2	±2.3	190	0.502
4.065	-147.5	-20.2	14.4	15.2	±2.3	182	0.503
4.115	-168.0	-21.0		15.2	±2.3	257	0.503
4.165	-165.8	-22.1	10.9	12.8	±2.0	1730	0.504
4.215	-186.0	-23.4	1.1	12.8	±2.0	2940	0.505
4.265	-194.1	-24.6	2.9	12.8	±2.0	2930	0.506
4.315		-25.4		12.8	±2.0	3020	0.506
4.365	-202.8	-25.4	0.7	13.1	±2.3	3000	0.507
4.415	-196.3	-24.7	1.4	13.1	±2.3	3080	0.508
4.470	-188.5	-24.2	4.9	13.1	±2.3	3320	0.509
4.525	-159.5	-20.7	5.9			1639	0.510
4.575	-156.2	-20.3	6.4	19.4	±3.2	631	0.510
4.625	-152.5	-19.3	1.7	19.4	±3.2	1086	0.511
4.675	-148.7	-19.5	7.1	19.4	±3.2	568	0.512
4.725	-150.0	-19.9	9.2	19.4	±3.2	316	0.513
4.775	-161.1	-20.5	2.7	21.4	±3.3	288	0.513
4.825	-157.6	-20.8	8.7	21.4	±3.3	348	0.514
4.875	-153.5	-20.8	13.1	21.4	±3.3	349	0.515
4.925	-144.1	-19.8	14.2	21.4	±3.3	469	0.516
4.975	-135.6	-18.9	15.3	13.7	±2.1	761	0.517
5.025	-127.2	-17.7	14.7	13.7	±2.1	2490	0.517
5.075	-125.6	-16.8	8.7	13.7	±2.1	2830	0.518
5.125	-119.6	-16.5	12.4	13.7	±2.1	2660	0.519
5.175	-119.2	-16.5	12.4	14.8	±2.5	2670	0.520
5.220	-127.2	-16.5	4.8	14.8	±2.5	2060	0.495
5.265	-128.3	-17.1	8.3	16.8	±3.0	983	0.496
5.315	-127.7	-17.8	14.5	16.8	±3.0	1724	0.496
5.365	-126.9			16.8	±3.0	2740	0.497
5.415	-132.4	-18.0	11.2	24.1	±3.0	2820	0.498
5.465	-147.0	-19.3	7.2	24.1	±3.0	235	0.498
5.515	-155.4	-20.3	7.1	24.1	±3.0	454	0.499
5.565	-158.5	-20.6	6.7	24.1	±3.0	497	0.499
5.615	-159.8	-20.8	6.5	23.8	±3.0	348	0.500
5.665	-155.9	-20.4	7.5	23.8	±3.0	8560	0.501
5.715	-151.3	-19.7	6.0	23.8	±3.0		0.501
5.765	-145.4	-18.9	5.7	23.8	±3.0	2470	0.502
5.815	-138.3	-18.1	6.7	23.1	±3.1	182.8	0.503
5.865	-139.9	-18.1	5.2	23.1	±3.1	135.1	0.503
5.915	-140.3	-18.2	5.1	23.1	±3.1	128	0.504
5.965	-147.5	-19.1	5.4	23.1	±3.1	842	0.504
6.015	-159.0	-20.2	2.5	28.2	±3.2	95.7	0.505
6.065	-159.2	-20.0	1.2	28.2	±3.2	78.9	0.506

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
6.115	-156.6	-19.8	1.9	28.2	±3.2	124.4	0.506
6.165	-151.4	-19.3	3.0	28.2	±3.2	188.6	0.507
6.215	-145.8	-19.1	7.2	29.1	±3.3	116.8	0.507
6.265	-148.3	-19.0	3.9	29.1	±3.3	70.1	0.508
6.315	-152.4	-19.3	1.7	29.1	±3.3	130.8	0.509
6.365	-155.2	-19.5	1.2	29.1	±3.3	161.9	0.509
6.415	-152.9	-19.3	1.7	26.9	±3.7	122.4	0.510
6.465	-150.5	-19.0	1.7	26.9	±3.7	92.2	0.510
6.515	-146.6	-18.5	1.0	26.9	±3.7	65.4	0.511
6.565	-139.8	-17.9	3.6	26.9	±3.7	98.5	0.512
6.615	-137.1	-17.7	4.5	37.7	±3.9	141.8	0.512
6.665	-140.3	-18.1	4.8	37.7	±3.9	153.3	0.513
6.715	-156.2	-19.7	1.6	37.7	±3.9	142.3	0.514
6.755	-171.3	-21.4	-0.3	37.7	±3.9	173.6	0.514
6.795	-185.9	-23.0	-1.7	58.6	±4.8	385	0.514
6.845	-189.8	-23.5	-2.2	58.6	±4.8	394	0.515
6.895	-185.1	-23.0	-0.8	58.6	±4.8	383	0.516
6.945	-171.2	-21.3	-1.0	58.6	±4.8	560	0.516
6.995	-154.2	-19.5	1.7	46.6	±4.2	5330	0.517
7.045	-141.5	-18.3	5.1	46.6	±4.2	854	0.518
7.095	-136.3	-17.6	4.9	46.6	±4.2	853	0.518
7.145	-135.2	-17.3	3.0	46.6	±4.2	283	0.519
7.185	-135.5	-17.4	4.0	42.2	±5.3	401	0.519
7.225	-138.3	-17.6	2.4	42.2	±5.3	341	0.520
7.275	-137.3	-17.6	3.3	42.2	±5.3	247	0.520
7.325	-134.3	-17.2	3.5	42.2	±5.3	269	0.521
7.375	-130.9	-16.9	4.5	48.7	±4.3	292	0.522
7.425	-134.6	-16.8	-0.6	48.7	±4.3	333	0.522
7.475	-134.7	-17.2	2.7	48.7	±4.3	304	0.523
7.525	-145.0	-18.3	1.2	48.7	±4.3	384	0.523
7.575	-147.2	-18.5	0.8	66.9	±6.3	547	0.524
7.625	-149.1	-18.8	1.1	66.9	±6.3	830	0.525
7.675	-147.1	-18.8	3.3	66.9	±6.3	1309	0.525
7.725	-146.2	-18.8	4.1	66.9	±6.3	2910	0.526
7.775	-144.0	-18.6	5.2		±5.2	3060	0.526
7.805	-145.9	-18.7	4.0		±5.2		0.527
7.885	-146.4	-18.8	3.6	34.7	±3.5	5890	0.528
7.935	-147.0	-18.6	2.2	34.7	±3.5	2300	0.528
7.985	-146.3	-18.5	2.1	34.7	±3.5	2120	0.529
8.035	-144.9	-18.4	2.0	34.7	±3.5	1509	0.530
8.085	-142.3	-18.1	2.5	33.7	±3.7	198.1	0.530
8.135	-136.9	-17.4	2.5	33.7	±3.7	331	0.531
8.185	-129.8	-16.5	2.3	33.7	±3.7	917	0.531
8.235	-121.7	-15.5	2.5	33.7	±3.7	1766	0.532
8.285	-113.8	-14.7	3.5		±5.2	425	0.533
8.325	-114.3	-14.1	-1.3		±5.2	185.1	0.533
8.365	-112.8	-14.7	4.6		±5.3	105.5	0.534
8.415	-119.7	-15.4	3.1	70.9	±5.9	92.8	0.534
8.465	-163.3	-20.9	3.6	70.9	±5.9	103.5	0.535
8.515	-174.1	-23.0	9.5	70.9	±5.9	90.6	0.536
8.565	-185.8	-24.0	5.8	70.9	±5.9	171.2	0.536
8.615	-190.8	-24.5	4.9		±4.7	148.4	0.537
8.665	-191.2	-24.6	5.3		±4.7	84.7	0.537
8.720	-190.0	-24.4	5.0		±4.7	99.6	0.538
8.775	-191.8	-24.2	2.1	58.2	±5.3	354	0.539
8.825	-194.6	-24.7	2.8	58.2	±5.3	333	0.539
8.875	-195.8	-24.8	2.4	58.2	±5.3	239	0.540
8.925	-192.5	-24.2	0.9	56.8	±4.7	136.1	0.541
8.975	-184.0	-23.1	1.2	56.8	±4.7	183.1	0.541
9.025	-170.5	-21.7	3.2	56.8	±4.7	277	0.542
9.075	-163.7	-20.9	3.7	56.8	±4.7	109	0.542
9.125	-162.7	-21.0	5.6	33.9	±3.4	47.4	0.543
9.175	-166.3	-21.4	4.8	33.9	±3.4	43.9	0.544
9.225	-172.9	-22.2	4.8	33.9	±3.4	49.1	0.544
9.275	-179.0	-22.8	3.7	33.9	±3.4	40.3	0.545
9.325	-183.4	-23.4	3.6	60.8	±5.1	71.4	0.545
9.375	-185.7	-23.7	3.7	60.8	±5.1	144.7	0.546

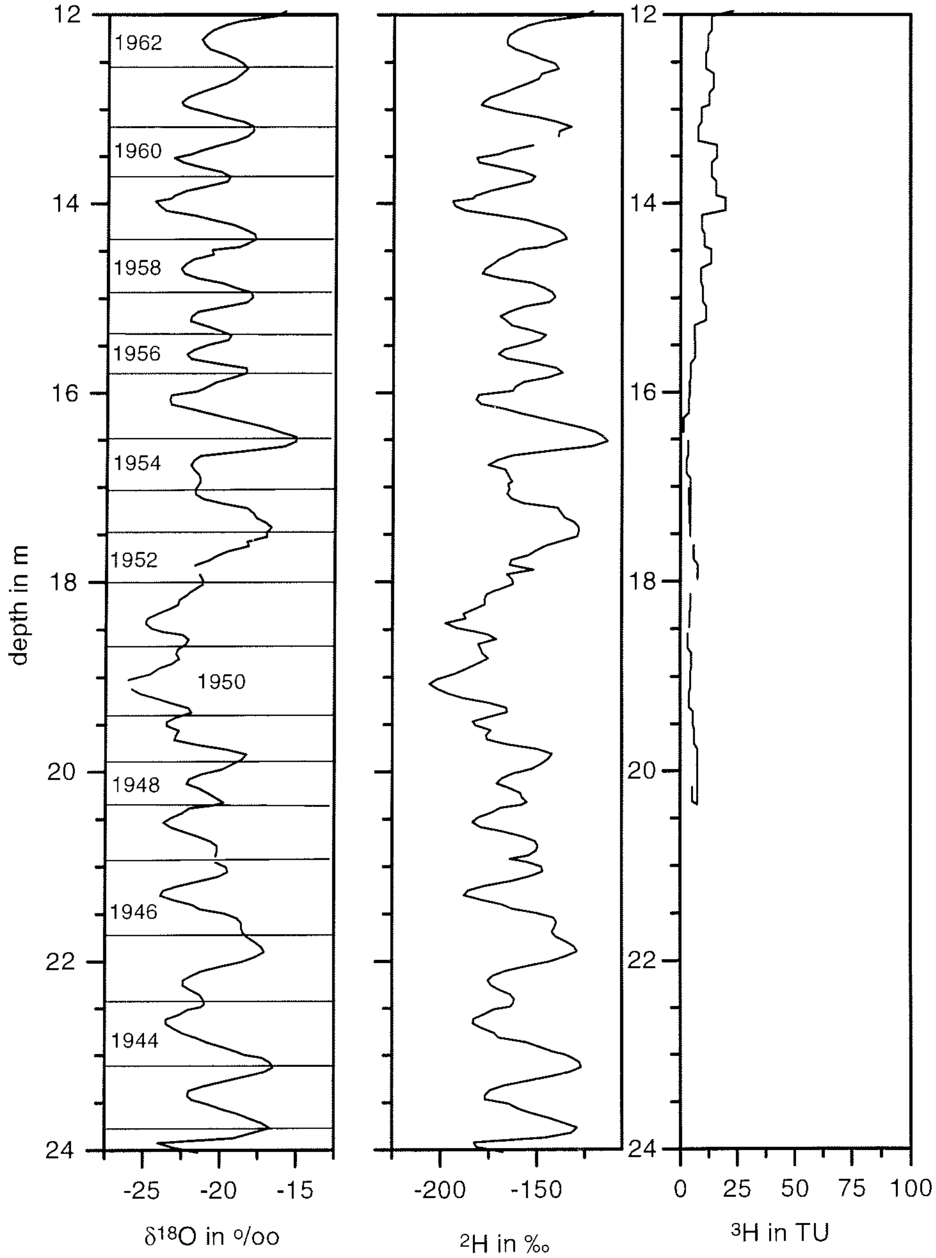
Mean Depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
9.425	-192.7	-24.3	1.9	60.8	±5.1	363	0.547
9.475	-196.1	-24.8	2.1	60.8	±5.1	181.1	0.547
9.525	-196.7	-24.7	1.0	88.5	±6.6	117	0.548
9.575	-195.1	-24.7	2.7	88.5	±6.6	128.6	0.548
9.625	-189.6	-23.7	-0.2	88.5	±6.6	168.7	0.549
9.675	-177.2	-22.9	5.8	88.5	±6.6	111.2	0.550
9.725	-164.0	-21.2	5.7	57.1	±4.7	7130	0.550
9.775	-164.1	-21.3	6.5	57.1	±4.7	11310	0.551
9.825	-169.3	-22.0	6.4	57.1	±4.7	4510	0.552
9.875	-179.4	-22.5	0.2	57.1	±4.7	427	0.552
9.925	-168.5	-22.2	9.2	41.9	±3.8	275	0.553
9.975	-159.6	-20.8	6.7	41.9	±3.8	826	0.553
10.025	-146.6	-19.0	5.7	41.9	±3.8	3570	0.554
10.075	-131.6	-17.5	8.2	41.9	±3.8	1935	0.555
10.125	-121.9	-16.2	7.5	35.4	±3.5	2750	0.555
10.175	-116.9	-15.4	6.5	35.4	±3.5	293	0.556
10.225	-115.5	-14.9	3.5	35.4	±3.5	364	0.556
10.275	-116.2	-15.5	7.6	35.4	±3.5	1328	0.557
10.315	-117.1	-15.3	5.5		±5.2	223	0.558
10.355	-130.0	-16.6	2.6	73.0	±5.6	102	0.558
10.405	-137.5	-17.4	1.9	73.0	±5.6	114	0.559
10.455	-145.7	-18.2	0.1	73.0	±5.6	135	0.559
10.505	-143.2	-18.4	4.2	73.0	±5.6	108	0.560
10.555	-138.9	-17.9	3.9	55.4	±4.6	476	0.560
10.605	-127.5	-16.7	6.1	55.4	±4.6	1463	0.561
10.655	-119.6	-15.7	6.3	55.4	±4.6	1525	0.562
10.705	-110.9	-14.9	8.5	55.4	±4.6	335	0.562
10.755	-106.4	-14.6	10.3	38.7	±5.2	251	0.563
10.805	-114.3	-14.8	4.0	38.7	±5.2	75	0.564
10.850	-120.1	-15.6	4.5	38.7	±5.2	137.9	0.564
10.895	-139.5	-18.0	4.5		±3.4	272	0.565
10.945	-143.9	-18.5	3.7	41.3	±3.9	223	0.565
10.995	-149.3	-19.1	3.7	41.3	±3.9	674	0.566
11.045	-149.2	-19.4	5.8	41.3	±3.9	1084	0.566
11.095	-147.9	-19.3	6.6	41.3	±3.9	703	0.567
11.145	-147.1	-19.1	5.8	31.2	±3.4	89.1	0.568
11.195	-146.4	-19.0	5.2	31.2	±3.4	75.1	0.568
11.245	-145.2	-18.7	4.7	31.2	±3.4	70.6	0.569
11.285	-145.3	-18.5	3.1	31.2	±3.4	144.2	0.569
11.325	-146.1	-18.8	4.6		±3.7	72.2	0.570
11.375	-149.2	-19.1	3.8		±3.7	82.2	0.570
11.425	-151.8	-19.8	6.8	31.6	±4.2	164.1	0.571
11.475	-160.6	-20.7	5.2	31.6	±4.2	194.7	0.572
11.525	-167.4	-21.5	4.9	31.6	±4.2	213	0.572
11.575	-171.5	-22.0	4.8	31.6	±4.2	75.1	0.573
11.625	-170.4	-22.2	7.4	25.1	±4.0	84.3	0.574
11.675	-162.2	-21.0	6.1	25.1	±4.0	65.2	0.574
11.725	-149.7	-19.5	6.4	25.1	±4.0	46.3	0.575
11.775	-138.6	-18.1	6.1	25.1	±4.0	55.1	0.575
11.825	-127.7	-16.9	7.1		±3.4	117.5	0.576
11.870	-121.9	-16.1	6.6		±3.4	83.2	0.577
11.915	-124.9	-15.8	1.2	23.1	±3.7	119.7	0.577
11.965	-121.0	-15.9	6.4	23.1	±3.7	70.8	0.578
12.015	-126.0	-16.5	6.3	13.6	±3.1	85.1	0.578
12.065	-146.4	-18.9	4.6	13.6	±3.1	65.0	0.579
12.115	-155.1	-19.9	4.3	13.6	±3.1	60.3	0.580
12.165	-161.2	-20.7	4.7	13.6	±3.1	76.4	0.580
12.215	-165.0	-21.1	3.6	12.0	±4.4	94.5	0.581
12.265	-166.3	-21.4	4.5	12.0	±4.4	74.9	0.581
12.315	-166.1	-21.2	3.5	12.0	±4.4	63.7	0.582
12.365	-162.1	-20.9	5.4	12.0	±4.4	47.5	0.583
12.415	-154.7	-20.0	5.0	11.0	±3.2	48.9	0.583
12.465	-148.7	-19.2	4.9	11.0	±3.2	40.7	0.584
12.515	-141.1	-18.7	8.3	11.0	±3.2	39.6	0.584
12.570	-139.2	-18.4	8.2	11.0	±3.2	55.4	0.585
12.625	-148.1	-18.8	2.4	14.5	±3.0	64.7	0.586
12.675	-149.8	-19.2	3.5	14.5	±3.0	55.6	0.586

Year	Layer thickness [m]	mean ^{18}O [‰]	mean ^{2}H [‰	mean ^{3}H TU	annual accumulation mm w.e.
1981	0.591	-21.10	-162.9	12.7	***
1980	0.963	-18.16	-138.5	17.1	127
1979	1.205	-20.13	-155.5	19.7	171
1978	0.835	-18.10	-137.7	17.6	197
1977	0.401	-17.11	-129.9	13.9	176
1976	0.561	-22.86	-177	14.4	139
1975	0.499	-19.15	-142.8	18.0	144
1974	0.707	-18.75	-140.8	21.1	180
1973	0.391	-19.26	-150.2	26.5	211
1972	0.351	-18.94	-149.3	27.9	265
1971	0.508	-20.36	-161.5	48.2	279
1970	0.331	-17.30	-135.2	44.7	482
1969	0.889	-17.78	-139.8	45.6	447
1968	0.826	-22.08	-172.8	60.1	456
1967	0.588	-23.36	-183.6	63.0	601
1966	0.462	-19.74	-151.7	46.0	630
1965	0.542	-16.51	-127.5	58.0	460
1964	0.522	-17.89	-137.8	37.6	580
1963	0.647	-19.55	-150.8	28.4	376
1962	0.646	-19.32	-149.6	13.7	284
1961	0.648	-20.32	-157.5	11.7	137
1960	0.501	-20.54	-160.4	12.6	117
1959	0.647	-21.31	-166.1	14.2	126
1958	0.584	-20.57	-160	10.8	142
1957	0.438	-20.22	-156.2	9.5	108
1956	0.376	-20.70	-156.6	5.9	95
1955	0.731	-20.02	-152.4	3.2	59
1954	0.468	-19.77	-152.2	3.2	32
1953	0.471	-19.60	-150.4	3.8	32
1952	0.561	-19.28	-148.5	6.0	38
1951	0.689	-22.99	-179.3	4.2	60
1950	0.663	-23.94	-187.5	4.3	42
1949	0.485	-22.15	-170	6.0	43
1948	0.458	-20.49	-157.5	6.2	60
1947	0.613	-21.60	-164.3	5.5	62
1946	0.816	-20.76	-159.1		55
1945	0.689	-19.76	-152.6		
1944	0.681	-21.14	-162.9		
1943	0.670	-19.34	-153.2		
1942	0.307	-20.24	-155.6		
1941	0.612	-21.93	-170.1		
1940	0.408	-20.39	-160.4		
1939	0.535	-20.60	-163.8		
1938	0.740	-20.31	-137.1		
1937	0.485	-22.19	-163.5		
1936	0.586	-25.03	-189.5		
1935	0.434	-22.43	-179.9		
1934	0.485	-20.78	-160.7		
1933	0.382	-20.50	-157.6		
1932	0.536	-20.82	-157.7		
1931	0.561	-19.07	-144.1		
1930	0.663	-20.81	-166.8		
1929	0.454	-23.54	-179.4		
1928	0.516	-20.99			
1927	0.535	-23.16			
1926	0.281	-21.02			
1925	0.459	-19.64	-124.8		
1924	0.434	-21.70	-166.4		
1923	0.382	-21.71	-167.2		
1922	0.306	-20.01	-154.5		
1921	0.332	-18.74	-142.7		
1920	0.663	-20.18	-137.7		
1919	0.612	-20.26	-139.4		
1918	0.612	-21.26	-162.2		
1917	0.766	-19.92	-155.2		
1916	0.459	-19.91	-155.6		
1915	0.503	-22.54	-175.2		
1914	0.572	-21.07	-163.3		
1913	0.571	-21.24	-167.3		
1912	0.434	-21.41	-166.6		
1911	0.433	-21.49	-166.2		

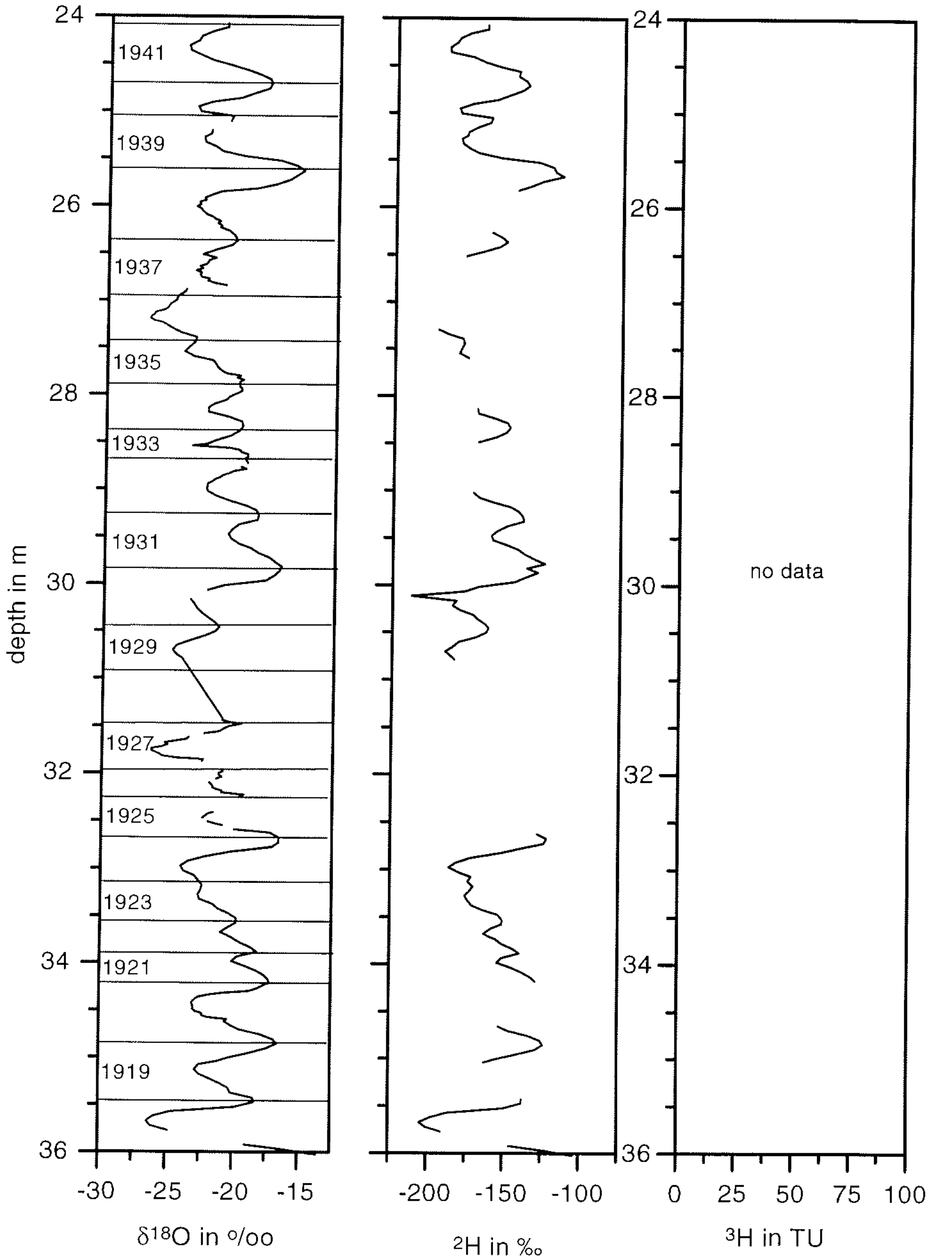
Year	Layer thickness	mean ^{18}O	mean ^{2}H	mean ^{3}H	annual accumulation
	[m]	[‰]	[‰	TU	mm w.e.
1910	0.414	-22.56	-175.9		
1909	0.690	-22.38	-172.1		
1908	0.316	-21.19	-164.9		
1907	0.571	-22.59	-173.7		
1906	0.473	-19.60	-148.3		
1905	0.572	-19.72	-151.3		
1904	0.670	-19.73	-154.8		
1903	0.591	-18.02	-141.4		
1902	0.749	-19.57	-153.3		
1901	0.414	-21.04	-164.6		
1900	0.513	-23.40	-180.6		
1899	0.729	-24.17	-186.8		
1898	0.493	-22.55	-171.1		
1897	0.611	-22.79	-173.5		
1896	0.552	-23.12	-176.4		
1895	0.354	-21.36	-160.5		
1894	0.473	-21.37	-162.2		
1893	0.414	-21.05	-158.9		
1892	0.434	-21.48	-162.5		



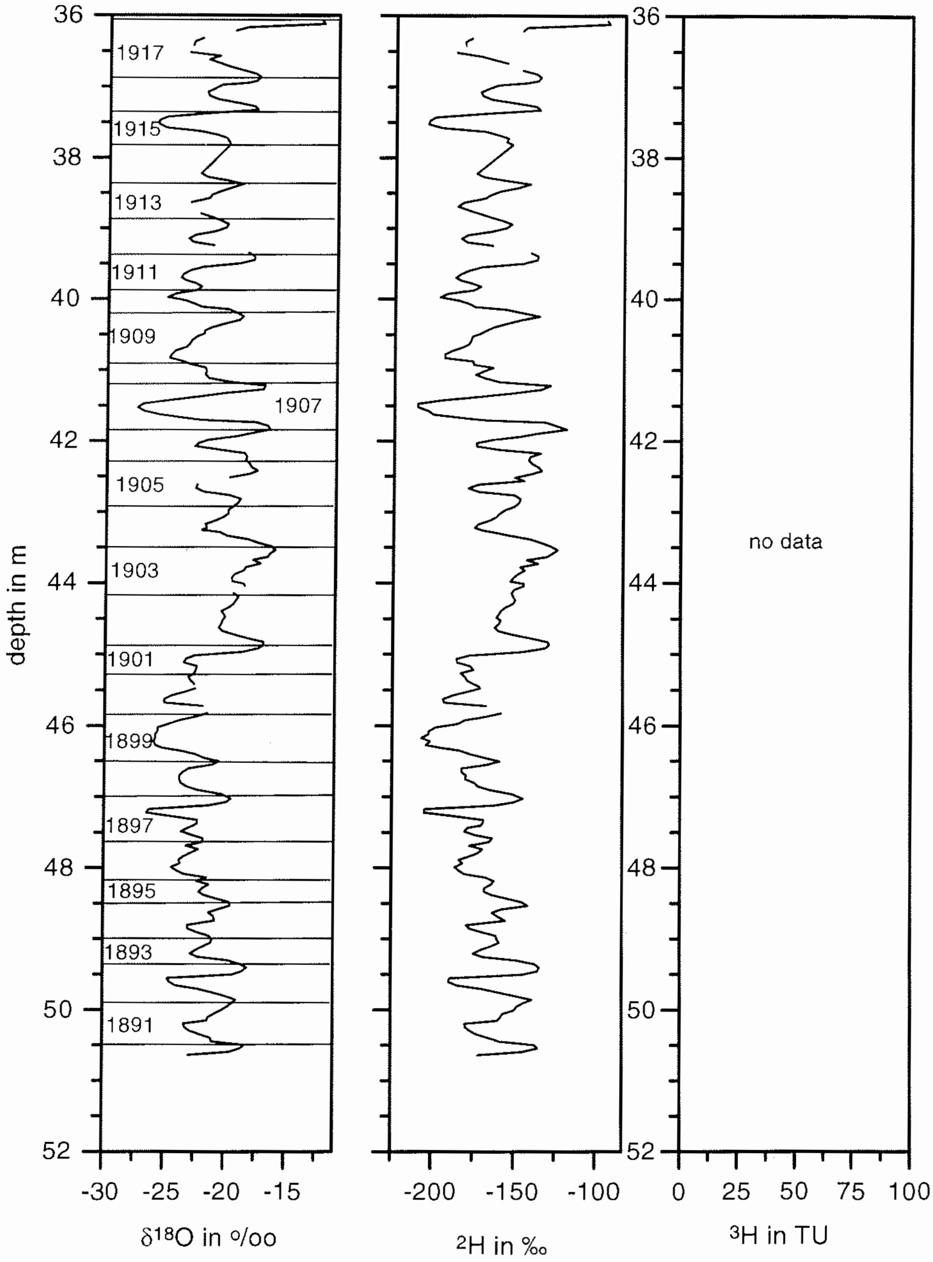
Shallow firn core B04, Georg-von-Neumayer Station, Feb. 1982



Shallow firn core B04. Georg-von-Neumayer Station, Feb. 1982



Shallow firn core B04, Georg-von-Neumayer Station, Feb.1982

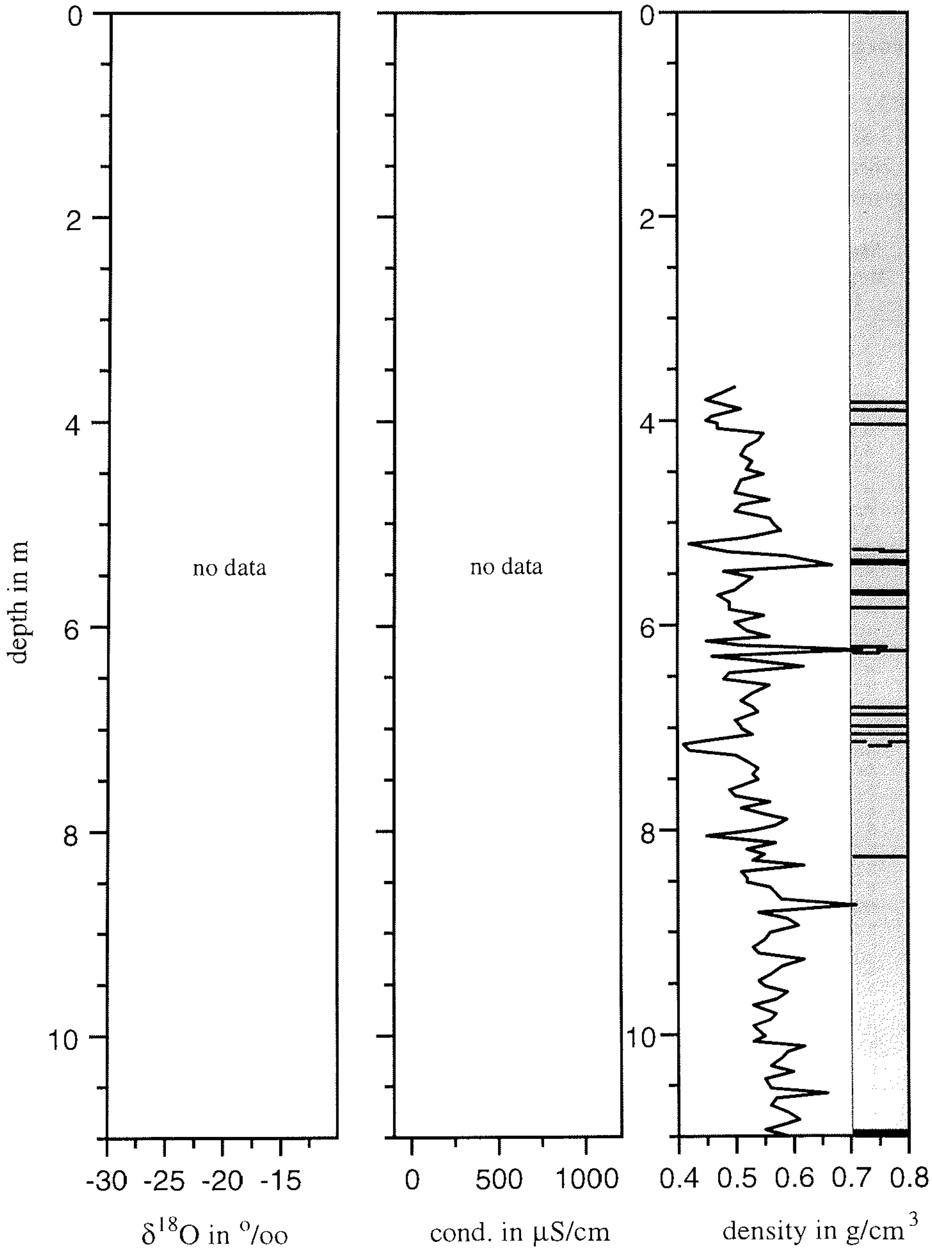


Shallow firn core B04, Georg-von-Neumayer Station, Feb.1982

Georg-von-Neumayer Station

70°37'S 8°22'W
19.2.82
11.28m
fbgvn0282

Mean Depth [m]	Density [g/cm³]
3.715	0.420
3.770	0.500
3.845	0.520
3.925	0.540
3.980	0.530
4.015	0.540
4.055	0.510
4.105	0.490
4.165	0.500
4.423	0.560
4.300	0.510
4.370	0.550
4.440	0.590
4.505	0.570
4.560	0.530
4.650	0.450
4.745	0.570
4.805	0.520
4.860	0.550
4.925	0.530
4.995	0.620
5.055	0.510
5.115	0.520
5.180	0.520
5.235	0.560
5.275	0.570
5.310	0.580
5.375	0.710
5.450	0.540
5.510	0.590
5.600	0.610
5.685	0.560
5.745	0.550
5.815	0.530
5.880	0.540
5.945	0.620
6.020	0.580
6.090	0.560
6.140	0.540
6.180	0.550
6.225	0.590
6.228	0.570
6.330	0.530
6.380	0.570
6.440	0.560
6.500	0.530
6.560	0.550
6.630	0.530
6.705	0.620
6.770	0.590
6.825	0.580
6.890	0.560
6.960	0.600
7.000	0.550
7.040	0.560
7.095	0.660
7.140	0.570
7.190	0.500
7.245	0.450
7.300	0.510
7.365	0.460
7.430	0.450
7.485	0.470
7.540	0.470
7.590	0.550
7.640	0.540
7.700	0.520
7.760	0.510
7.820	0.530
7.875	0.520
7.930	0.550
7.985	0.510
8.035	0.500
8.095	0.560
8.160	0.510
8.215	0.500
8.270	0.560
8.325	0.570
8.380	0.580
8.440	0.520
8.490	0.420
8.535	0.460
8.590	0.490
8.650	0.590
8.710	0.670
8.775	0.480
8.840	0.530
8.905	0.500
8.975	0.470
9.045	0.490
9.115	0.490
9.180	0.550
9.240	0.500
9.305	0.520
9.380	0.560
9.450	0.450
9.505	0.510
9.560	0.720
9.625	0.460
9.690	0.530
9.760	0.620
9.830	0.490
9.890	0.480
9.970	0.560
10.045	0.530
10.095	0.510
10.145	0.530
10.200	0.540
10.270	0.500
10.340	0.510
10.405	0.510
10.485	0.530
10.555	0.460
10.605	0.410
10.665	0.560
10.735	0.590
10.805	0.610
10.865	0.580
10.915	0.550
10.970	0.590
11.025	0.600
11.080	0.530
11.195	0.580



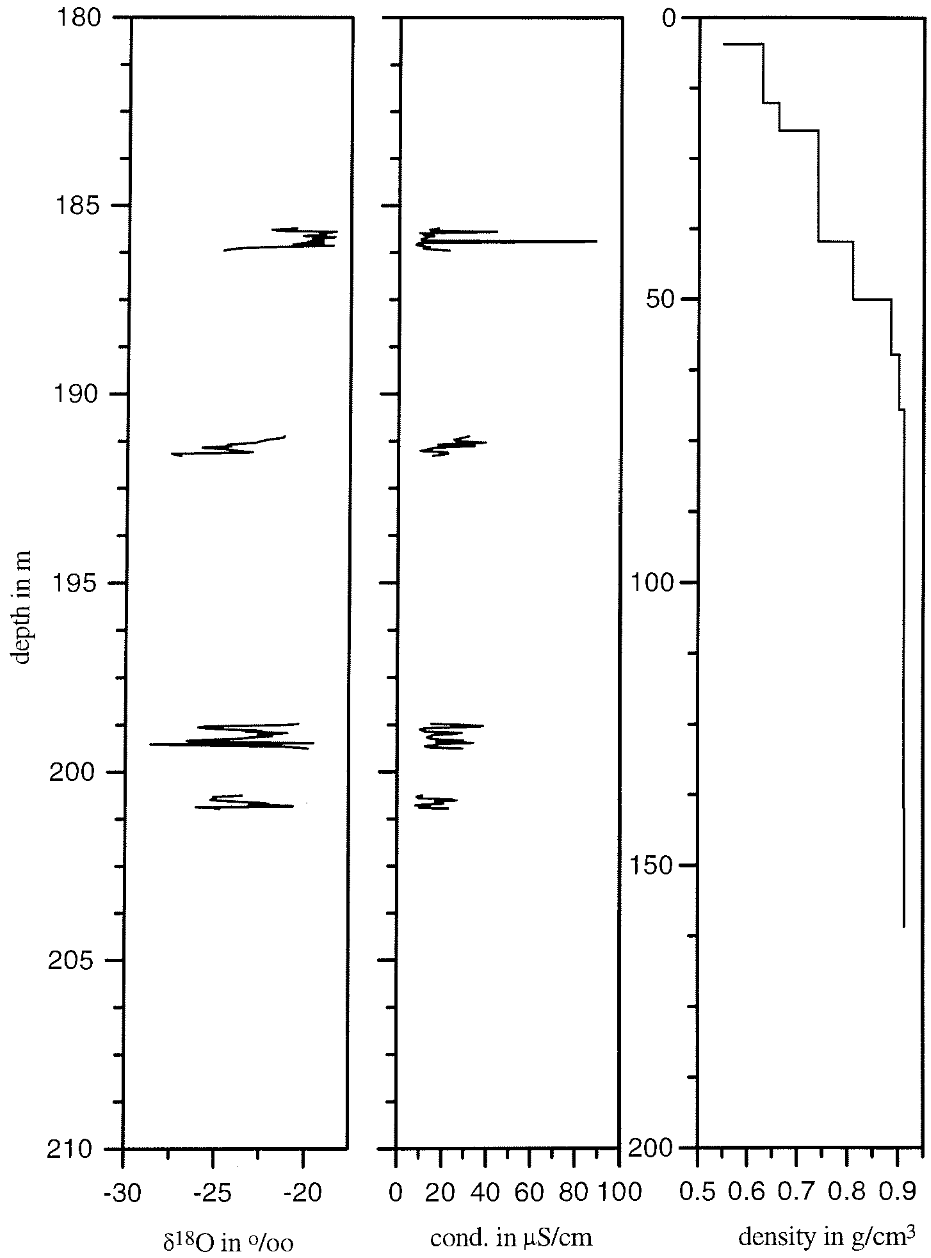
Shallow firn core, GvN, Feb.1982

Georg-von-Neumayer Station (Fahrzeughalle)

70°37'S 8°22'W
15.1.-30.1.1983
202.8m
B06

Remarks

This core was mainly taken for investigations of mechanical properties of ice shelfs at the University of Bochum. Only some parts of the lower end of the core were used for isotope ananlysis. Even at depths below 180m the $\delta^{18}O$ values show large variations of up to 8‰, which may be caused by seasonal or multi-seasonal variations of the isotope content of precipitation. But the minimum values do not exceed -30‰, indicating that the ice was deposited mainly on the ice shelf itself.

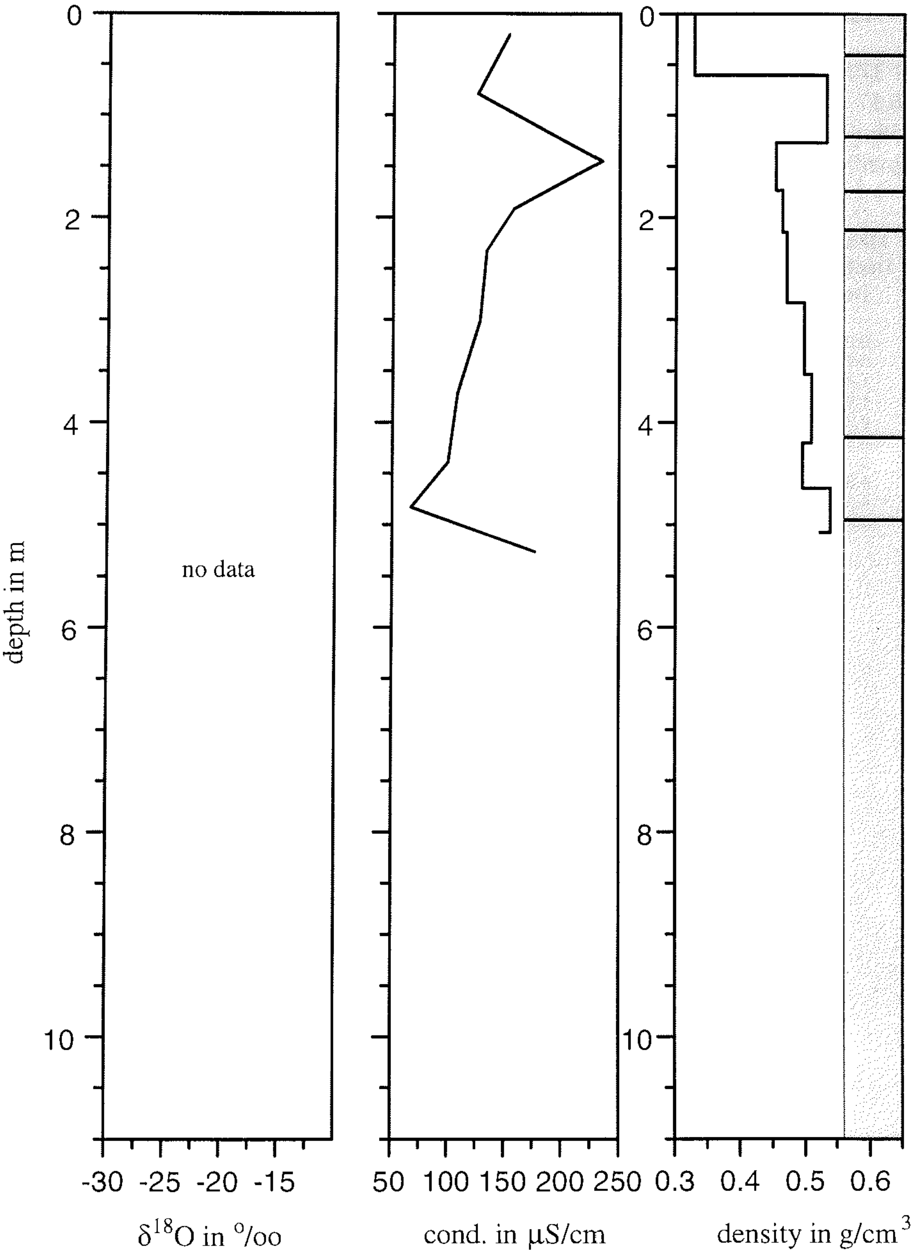


Shallow firn core B06, Georg-von-Neumayer Station, January 1983

Georg-von-Neumayer Station

70°37'S 8°22'W
2.6.87
5.58m
fbgvn0687

Mean Depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^{3}]
0.21						153.0	0.324
0.79						125.5	0.531
1.45						235.0	0.450
1.92						157.5	0.460
2.33						133.5	0.467
3.02						127.5	0.493
3.72						108.0	0.505
4.39						99.7	0.491
4.83						66.8	0.536
5.26						177.0	0.519



Shallow firn core, GvN, June 1987

Neumayer Station

70°39'31"S 8°15'9"W
27.12.89
9.98m
FB0189

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm3]
0.054		-30.4				77.8	0.460
0.081		-31.1				51.4	0.460
0.108		-30.9				51.9	0.460
0.135		-28.9				67.2	0.460
0.162		-26.2				58.7	0.460
0.189		-24.1				50.5	0.460
0.216		-23.0				51.9	0.390
0.243		-22.3				64.1	0.390
0.270		-22.3				42.9	0.390
0.300		-22.2				75.9	0.390
0.324		-23.0				90.9	0.390
0.351		-23.2				111.2	0.390
0.378		-23.1				114.0	0.390
0.405		-22.8				109.3	0.430
0.432		-21.9				104.2	0.430
0.459		-20.1				195.9	0.430
0.486		-18.4				253.0	0.430
0.513		-17.3				90.7	0.430
0.540		-17.2				66.8	0.430
0.567		-16.9				50.1	0.430
0.595		-16.5				21.8	0.430
0.624		-14.6				15.4	0.433
0.652		-14.9				13.6	0.433
0.680		-15.9				173.0	0.433
0.708		-16.6				230.0	0.433
0.736		-16.4				236.0	0.433
0.764		-16.3				246.0	0.433
0.792		-15.7				258.0	0.434
0.820		-15.0				254.0	0.434
0.848		-14.3				299.0	0.434
0.876		-13.6				297.0	0.434
0.904		-12.7				339.0	0.434
0.932		-11.9				406.0	0.434
0.960		-11.8				400.0	0.434
0.988		-12.0				198.2	0.373
1.016		-12.6				137.7	0.373
1.044		-13.4				31.0	0.373
1.071		-15.2				89.6	0.373
1.097		-16.4				90.3	0.373
1.123		-17.2				85.0	0.373
1.149		-17.9				87.2	0.373
1.175		-18.2				84.4	0.414
1.201		-18.6				75.0	0.414
1.227		-18.6				91.2	0.414
1.253		-18.9				85.2	0.414
1.279		-19.5				93.8	0.414
1.306		-20.6				39.8	0.414
1.332		-23.8				37.5	0.424
1.356		-24.7				16.2	0.424
1.380		-25.3				12.9	0.424
1.404		-25.4				15.2	0.424
1.428		-24.8				42.1	0.424
1.452		-23.5				64.8	0.424
1.476		-22.2				88.1	0.424
1.500		-20.3				68.4	0.424

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
1.524		-18.8				65.7	0.424
1.548		-18.0				79.3	0.424
1.572		-17.6				141.0	0.424
1.596		-17.4				32.3	0.424
1.620		-18.1				14.1	0.424
1.644		-22.3				9.8	0.424
1.668		-21.3				12.3	0.424
1.692		-22.3				21.8	0.424
1.716		-22.7				19.3	0.424
1.740		-22.7				19.8	0.424
1.764		-22.7				19.4	0.424
1.788		-22.8				27.3	0.424
1.810		-23.7				47.0	0.468
1.830		-23.6				30.8	0.468
1.850		-22.9				62.2	0.468
1.870		-20.1				174.8	0.468
1.890		-19.5				209.0	0.468
1.920		-19.3				210.0	0.468
1.940		-19.4				216.0	0.468
1.960		-19.5				223.0	0.468
1.980		-20.0				230.0	0.468
2.000		-20.5				239.0	0.468
2.020		-20.9				547.0	0.468
2.040		-21.2				528.0	0.468
2.060		-21.5				513.0	0.457
2.080		-21.7				383.0	0.457
2.100		-21.6				286.0	0.457
2.130		-21.3				153.7	0.457
2.150		-20.9				164.5	0.457
2.170		-20.3				56.7	0.457
2.190		-20.0				16.6	0.457
2.210		-19.6				13.3	0.457
2.230		-20.0				10.0	0.457
2.250		-20.4				9.4	0.410
2.270		-21.1				13.8	0.410
2.290		-21.7				21.3	0.410
2.310		-22.5				42.6	0.410
2.340		-23.4				9.8	0.410
2.360		-23.5				8.2	0.410
2.380		-23.7				9.7	0.410
2.400		-23.6				10.5	0.410
2.420		-23.1				67.8	0.410
2.441		-22.2				76.1	0.491
2.462		-22.2				50.4	0.491
2.483		-21.7				44.6	0.494
2.504		-21.5				45.0	0.491
2.525		-21.5				42.9	0.491
2.546		-21.2				53.8	0.491
2.567		-21.2				73.8	0.497
2.588		-21.2				20.3	0.497
2.609		-21.4				33.5	0.497
2.630		-21.6				81.8	0.497
2.651		-21.6				81.6	0.497
2.672		-21.6				58.0	0.497
2.693		-21.5				58.3	0.497
2.714		-21.5				68.2	0.497
2.735		-21.8				114.2	0.497
2.756		-21.1				109.8	0.497
2.777		-20.9				115.9	0.497
2.798		-21.0				114.0	0.486
2.819		-21.0				107.6	0.486
2.840		-21.1					0.486
2.861		-21.4				25.2	0.486
2.882		-21.7				10.0	0.486
2.903		-22.0				9.7	0.486
2.924		-22.2				12.0	0.486
2.945		-22.9				12.7	0.486
2.970		-22.7				15.0	0.486
2.990		-22.8				20.8	0.486

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
3.005		-21.4				91.8	0.495
3.026		-21.2				112.2	0.495
3.048		-21.4				114.8	0.495
3.070		-21.4				105.1	0.495
3.092		-21.2				79.1	0.495
3.114		-21.5				78.9	0.495
3.136		-21.2				91.4	0.495
3.158		-20.9				76.1	0.495
3.180		-20.8				76.1	0.495
3.202		-20.5				58.6	0.495
3.224		-19.8				61.2	0.495
3.246		-19.2				52.8	0.495
3.268		-19.2				25.6	0.495
3.290		-20.0				21.3	0.495
3.312		-20.6				23.4	0.495
3.334		-21.9				18.0	0.495
3.356		-22.5				18.4	0.495
3.378		-23.4				18.6	0.495
3.400		-24.0				19.2	0.495
3.422		-24.2				18.6	0.495
3.444		-24.3				17.2	0.495
3.466		-24.0				19.0	0.495
3.488		-23.6				37.1	0.495
3.510		-18.9				32.4	0.495
3.531		-21.3				18.0	0.495
3.552		-21.2				10.3	0.437
3.573		-20.8				27.5	0.437
3.594		-20.6				48.0	0.437
3.615		-20.3				224	0.437
3.636		-20.2				209	0.437
3.657		-19.8				129	0.437
3.678		-19.6				9.5	0.437
3.699		-20.2				5.9	0.437
3.720		-20.6				7.7	0.437
3.741		-21.2				8.6	0.437
3.762		-21.5				7.7	0.516
3.783		-21.8				8.1	0.516
3.804		-22.7				8.2	0.516
3.825		-23.0				9.4	0.516
3.846		-23.4				7.9	0.516
3.867		-20.9				20.1	0.516
3.888		-24.2				20.5	0.516
3.909		-24.3				19.8	0.516
3.930		-24.5				29.1	0.516
3.952		-24.7				38.0	0.516
3.975		-24.4				52.4	0.516
3.998		-24.9				47.8	0.532
4.021		-24.4				29.5	0.532
4.044		-24.2				26.2	0.532
4.067		-24.1				28.8	0.532
4.089		-21.9				48.4	0.532
4.112		-16.6				23.5	0.476
4.135		-16.7				38.0	0.476
4.158		-16.7				35.7	0.476
4.181		-16.8				35.8	0.476
4.204		-17.0				21.6	0.476
4.227		-17.7				22.3	0.476
4.250		-18.1				32.1	0.476
4.273		-18.7				38.4	0.476
4.296		-19.8				48.5	0.517
4.319		-20.3				54.0	0.517
4.342							0.517
4.365		-20.3				25.6	0.517
4.388		-20.5				25.9	0.517
4.411		-20.7				26.5	0.517
4.434		-20.9				24.8	0.517
4.457		-20.9				25.1	0.517
4.480		-21.0				39.3	0.517
4.504		-20.9				46.9	0.528
4.529		-20.8				26.1	0.528
4.554		-20.6				26.8	0.528

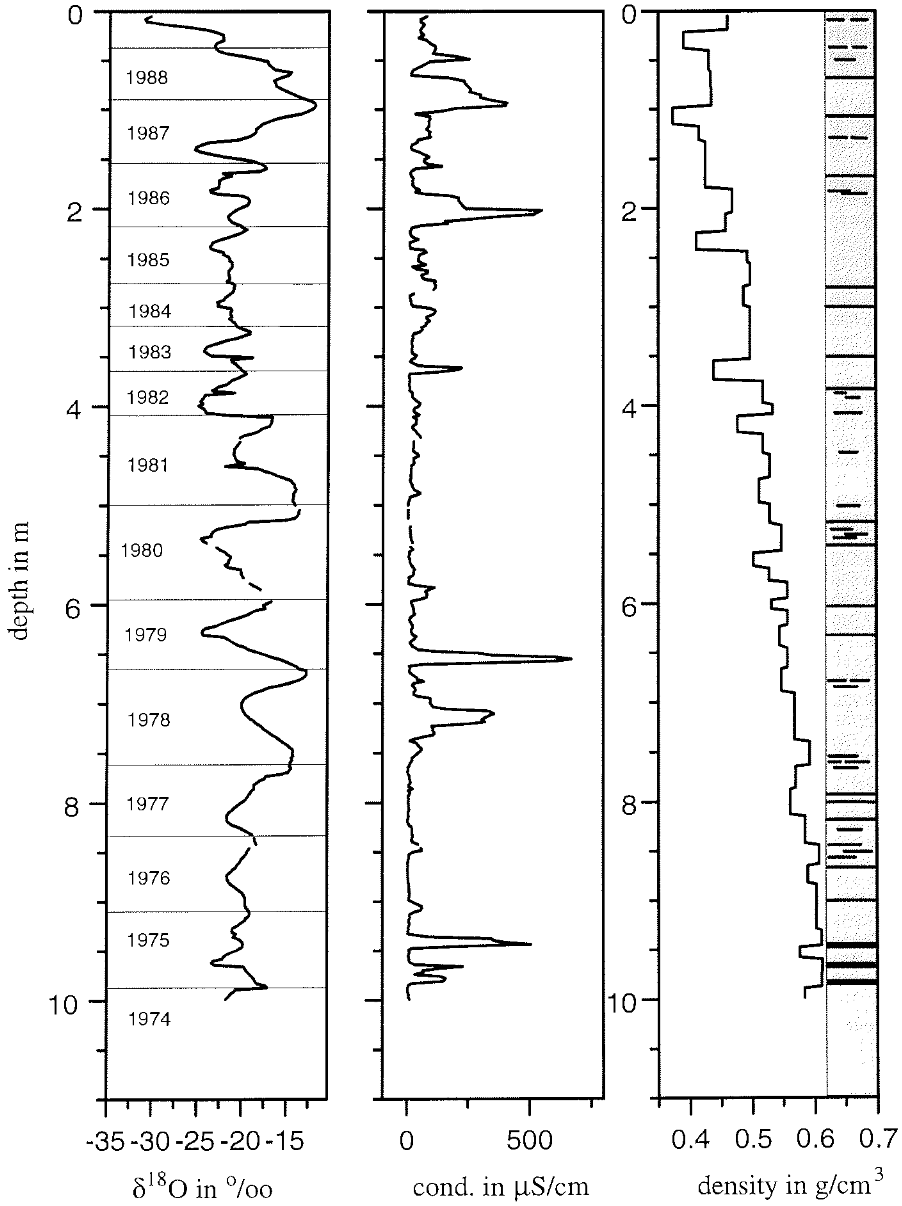
Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
4.579		-19.8				28.7	0.528
4.604		-21.9				17.6	0.528
4.629		-18.3				17.2	0.528
4.654		-17.6				15.7	0.528
4.679		-16.7				15.0	0.528
4.704		-16.1				13.0	0.528
4.728		-15.3				16.3	0.528
4.750		-14.5				10.4	0.511
4.770		-14.4				14.4	0.511
4.790		-14.1				19.4	0.511
4.810		-14.1				19.9	0.511
4.840		-13.9				28.2	0.511
4.860		-14.0				39.4	0.511
4.880		-14.2				53.3	0.511
4.900		-14.2				36.0	0.511
4.920		-14.2				10.5	0.511
4.940		-14.3				10.8	0.511
4.960		-14.3				7.3	0.511
4.980		-14.1				4.3	0.511
5.000		-14.0				3.8	0.528
5.030							0.528
5.050		-13.5				4.0	0.528
5.070		-13.6				3.7	0.528
5.090		-13.6				3.8	0.528
5.110		-13.8				3.5	0.528
5.130		-14.0				4.0	0.528
5.150		-15.1					0.528
5.170		-19.4				6.3	0.528
5.190		-19.7					0.528
5.220		-21.6				13.7	0.547
5.240		-22.8				11.6	0.547
5.260		-23.2				12.3	0.547
5.290		-23.4				13.4	0.547
5.310		-23.4				14.8	0.547
5.330		-24.6				15.6	0.547
5.350		-24.4				17.8	0.547
5.380		-24.0				23.1	0.547
5.400							0.547
5.420		-22.8				15.6	0.547
5.450		-22.5				25.8	0.547
5.470		-21.9				10.7	0.547
5.490		-21.7				10.9	0.502
5.510		-21.3				7.1	0.502
5.540		-21.3				9.2	0.502
5.560		-21.5				11.4	0.502
5.580		-21.5				13.3	0.502
5.600		-21.9				16	0.502
5.620		-21.6				23.7	0.502
5.650		-20.1				32.7	0.527
5.670		-20.1				26.7	0.527
5.690		-20.1				28.2	0.527
5.710		-20.0				24.6	0.527
5.730		-19.9				7.9	0.527
5.750						8.6	0.527
5.770						6.5	0.527
5.790		-19.1				6.8	0.557
5.810		-18.7				34.7	0.557
5.830		-18.2				113.1	0.557
5.850		-17.9				94.2	0.557
5.870						76.3	0.557
5.890						80.8	0.557
5.910						82.9	0.557
5.930						80.3	0.557
5.950						54.3	0.557
5.970		-16.7				19.4	0.531
5.990		-17.1				16.8	0.531
6.010		-17.6				21.9	0.531
6.040		-17.4				26.8	0.531
6.060		-18.4				27.3	0.531
6.080		-18.9				26.5	0.557
6.100		-19.3				33.7	0.557

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
6.120		-19.9				22.6	0.557
6.140		-20.6				12.7	0.557
6.160		-21.3				10.7	0.557
6.180		-21.9				14.7	0.557
6.200		-22.5				19.0	0.557
6.220		-22.9				23.7	0.557
6.240		-24.0				23.6	0.544
6.260		-24.3				18.3	0.544
6.280		-24.4				18.2	0.544
6.310		-24.3				23.5	0.544
6.330		-22.0				39.5	0.544
6.350		-21.6				32.2	0.544
6.370		-21.2				22.9	0.544
6.390		-20.9				12.9	0.544
6.410		-20.5				16.7	0.544
6.430		-19.8				26.1	0.544
6.460		-19.2				45.4	0.557
6.480		-18.4				119.6	0.557
6.500		-17.8				298.0	0.557
6.520		-17.1				346.0	0.557
6.540		-16.4				608.0	0.557
6.560		-15.6				670.0	0.557
6.580		-15.0				603.0	0.557
6.610		-14.3				62.2	0.557
6.630		-13.8				9.5	0.557
6.650		-13.6				12.1	0.557
6.670		-12.7				12.0	0.547
6.690		-12.7				12.0	0.547
6.710		-12.7				21.4	0.547
6.740		-13.0				41.1	0.547
6.760		-13.4				43.4	0.547
6.780		-14.1				69.9	0.547
6.800		-14.8				28.5	0.547
6.820		-15.7				22.1	0.547
6.840		-16.9				31.2	0.547
6.870		-17.7				36.7	0.547
6.890		-18.5				30.1	0.547
6.910		-19.0				28.3	0.568
6.930		-19.4				45.5	0.568
6.950		-19.7				96.6	0.568
6.980		-19.9				97.7	0.568
7.000		-20.0				95.8	0.568
7.020		-20.0				102.9	0.568
7.040		-20.0				109.1	0.568
7.060		-19.9				165.0	0.568
7.080		-19.8				337.0	0.568
7.110		-19.6				357.0	0.568
7.130		-19.3				334.0	0.568
7.150		-19.1				317.0	0.568
7.170		-18.7				306.0	0.568
7.190		-18.5				320.0	0.568
7.210		-18.2				257.0	0.568
7.230		-17.8				102.9	0.568
7.250		-17.6				107.8	0.568
7.270		-17.3				106.8	0.568
7.300		-16.8				114.3	0.568
7.320		-16.5				108.8	0.568
7.340		-16.1				67.0	0.568
7.360		-15.8				31.6	0.568
7.380		-15.5				12.6	0.568
7.400		-15.2				39.2	0.592
7.420		-14.8				46.3	0.592
7.440		-14.6				52.1	0.592
7.460		-14.3				61.6	0.592
7.480		-14.2				58.2	0.592
7.500		-14.3				47.2	0.592
7.530		-14.2				34.1	0.592
7.550		-14.4				22.4	0.592
7.570		-14.3				22.9	0.592
7.590		-14.5				19.1	0.592
7.610		-14.5				12.3	0.592

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
7.630		-14.6				11.4	0.592
7.650		-14.4				5.2	0.570
7.670		-14.6				5.4	0.570
7.690		-14.7				4.2	0.570
7.710		-15.5				5.1	0.570
7.730		-17.2				12.0	0.570
7.760		-17.5				11.2	0.570
7.780		-18.0				14.5	0.570
7.800		-18.3				16.4	0.570
7.820		-18.6				10.1	0.570
7.840		-18.6				9.2	0.570
7.860		-18.6				25.2	0.570
7.880		-18.9				5.9	0.561
7.900		-19.0				15.1	0.561
7.920		-19.2				10.7	0.561
7.940		-19.3				6.2	0.561
7.960		-19.5				7.4	0.561
7.980		-19.7				7.8	0.561
8.000		-20.1				7.2	0.561
8.030		-20.5				7.5	0.561
8.050		-20.8				7.3	0.561
8.070		-21.0				11.2	0.561
8.090		-21.3				7.5	0.561
8.110		-21.5				5.5	0.561
8.130		-21.6				6.7	0.561
8.150		-21.6				8.0	0.585
8.170		-21.6				5.3	0.585
8.190		-21.5				4.8	0.585
8.210		-21.2				5.5	0.585
8.230		-20.8				11.1	0.585
8.250		-20.2				20.7	0.585
8.270		-19.8				22.9	0.585
8.300		-19.2				23.2	0.585
8.320		-18.8				23.3	0.585
8.340						24.8	0.585
8.360		-18.5				22.8	0.585
8.380		-18.5				21.1	0.585
8.400		-18.4				26.2	0.585
8.420		-18.3				47.1	0.585
8.440							0.607
8.460		-19.1				60.1	0.607
8.480		-19.3				62.2	0.607
8.500		-19.4				23.8	0.607
8.520		-19.5				10.4	0.607
8.550		-19.8				8.8	0.607
8.570		-20.0				7.5	0.607
8.590		-20.1				7.2	0.607
8.610		-20.3				4.6	0.607
8.630		-20.5				5.6	0.607
8.650		-20.6				5.6	0.589
8.670		-20.9				4.8	0.589
8.690		-21.1				4.5	0.589
8.710		-21.4				6.3	0.589
8.730		-21.6				6.1	0.589
8.750		-21.6				5.4	0.589
8.780		-21.5				5.5	0.589
8.800		-21.4				6.5	0.589
8.820		-21.2				8.0	0.589
8.840		-20.9				9.5	0.603
8.860		-20.6				11.0	0.603
8.880		-20.3				10.7	0.603
8.900		-20.0				10.7	0.603
8.920		-19.8				13.8	0.603
8.940		-19.7				11.4	0.603
8.960		-19.6				11.8	0.603
8.980		-19.6				8.0	0.603
9.010		-19.6				26.6	0.603
9.030		-19.6				47.4	0.603
9.050		-19.5				62.5	0.603
9.070		-19.4				62.7	0.603
9.090		-19.2				58.3	0.603

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
9.110		-19.1				30.4	0.602
9.130		-19.1				13.4	0.602
9.150		-19.2				12.2	0.602
9.170		-19.5				13.1	0.602
9.190		-19.6				9.3	0.602
9.210		-19.9				7.9	0.602
9.230		-20.2				13.3	0.602
9.250		-20.5				8.9	0.602
9.270		-20.9				6.6	0.602
9.290		-21.0				7.6	0.602
9.310		-21.0				5.8	0.611
9.330		-20.6				5.7	0.611
9.360		-20.9				86.1	0.611
9.380		-20.3				343.0	0.611
9.400		-20.0				358.0	0.611
9.420		-19.8				399.0	0.611
9.440		-19.8				506.0	0.611
9.460		-19.9				168.6	0.611
9.480		-20.2				18.8	0.576
9.500		-20.6				7.6	0.576
9.520		-21.2				13.1	0.576
9.540		-21.7				7.9	0.576
9.560		-22.0				6.6	0.576
9.580		-22.1				10.3	0.576
9.600		-23.1				9.8	0.612
9.620		-23.3				14.9	0.612
9.640		-23.0				33.3	0.612
9.660		-19.7				229.0	0.612
9.680		-19.6				125.0	0.612
9.700		-19.4				66.0	0.612
9.720		-19.2				69.6	0.612
9.740		-19.0				34.6	0.611
9.760		-18.8				138.2	0.611
9.780		-18.6				160.3	0.611
9.810		-18.4				149.6	0.611
9.830		-18.2				22.8	0.611
9.850		-17.3				6.4	0.611
9.870		-17.1				6.0	0.611
9.890		-20.6				3.7	0.584
9.910		-20.8				3.8	0.584
9.930		-21.1				5.9	0.584
9.950		-21.3				8.6	0.584
9.970		-21.5				6.9	0.584
9.990		-21.7				12.1	0.584

Year	Layer thickness [m]	mean ^{18}O [‰]	mean ^2H [‰]	mean ^3H [TU]	annual accumulation [mm w.e.]
1988	0.609	-18.05			261
1987	0.640	-18.76			260
1986	0.618	-20.99			276
1985	0.566	-22.55			263
1984	0.469	-21.42			231
1983	0.433	-21.49			207
1982	0.433	-22.91			219
1981	0.941	-17.33			478
1980	0.920	-19.88			496
1979	0.700	-19.26			382
1978	0.980	-16.55			558
1977	0.730	-19.31			416
1976	0.750	-20.10			439
1975	0.740	-20.10			455



Shallow firn core FB0189, Neumayer, Dec.1989 (Construction Site)

Neumayer Station

70°39'31"S 8°15'9"W
14.03.92
9.80m
FB0192

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.029		-18.25				9.1	0.342
0.057		-19.69				8.6	0.342
0.086		-19.74				9.1	0.342
0.114		-17.72				10.0	0.254
0.143		-13.04				8.0	0.254
0.172		-12.04				11.5	0.254
0.200		-14.66				7.2	0.254
0.229		-19.56				6.0	0.485
0.257		-25.22				4.8	0.485
0.286		-23.19				5.7	0.485
0.315		-24.14				4.9	0.485
0.343		-25.28				4.8	0.485
0.372		-25.84				5.1	0.485
0.401		-25.74				4.9	0.485
0.429		-23.13				5.4	0.485
0.458		-20.06				10.8	0.485
0.486		-18.44				14.5	0.485
0.515		-18.36				13.5	0.485
0.540		-15.95				6.5	0.565
0.565		-16.37				7.7	0.565
0.590		-16.96				21.7	0.565
0.615		-17.34				9.5	0.565
0.640		-17.67				11.8	0.565
0.665		-17.88				12.8	0.565
0.690		-18.28				10.9	0.565
0.715		-18.30				5.7	0.565
0.740		-18.32				13.8	0.565
0.765		-18.92				17.6	0.562
0.790		-19.48				29.4	0.562
0.815		-20.08				33.3	0.562
0.840		-20.53				31.6	0.562
0.865		-20.70				31.6	0.562
0.890		-20.83				34.2	0.562
0.915		-20.78				29.6	0.562
0.940		-20.99				8.4	0.562
0.965		-21.23				5.6	0.562
0.990		-19.30				22.0	0.562
1.015		-18.78				25.8	0.562
1.040		-19.87				14.0	0.562
1.065		-19.84				8.8	0.562
1.090		-18.16				12.7	0.562
1.115		-19.02				17.6	0.562
1.140		-19.94				11.7	0.562
1.165		-19.22				11.2	0.562
1.190		-18.87				30.6	0.519
1.215		-19.05				28.0	0.519
1.240		-19.10				28.0	0.519
1.265		-19.37				27.6	0.519
1.290		-17.91				35.9	0.713
1.316		-17.73				35.9	0.713
1.341		-17.55				41.3	0.713
1.367		-17.34				44.5	0.713
1.392		-17.07				48.7	0.713
1.417		-17.27				112.5	0.713
1.443		-17.73				178.6	0.713
1.468		-16.58				187.6	0.713
1.493		-18.01				119.3	0.713
1.519		-14.92				53.8	0.587
1.544		-15.35				50.7	0.587

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^{3}]
1.570		-14.70				44.2	0.587
1.595		-14.77				45.2	0.587
1.620		-15.10				51.9	0.587
1.646		-15.27				96.2	0.587
1.671		-14.91				23.0	0.440
1.696		-15.11				13.3	0.440
1.722		-15.76				62.6	0.440
1.747		-18.91				325.0	0.440
1.773		-17.43				13.9	0.440
1.798		-18.47				8.5	0.440
1.823		-20.02				8.8	0.440
1.849		-21.67				9.4	0.440
1.874		-23.24				12.6	0.440
1.900		-24.24				13.7	0.440
1.925		-24.56				13.4	0.440
1.947		-24.21				152.5	0.492
1.969		-23.77				135.5	0.492
1.991		-23.09				96.7	0.492
2.013		-22.24				67.4	0.492
2.035		-21.41				33.9	0.492
2.056		-20.51				29.2	0.492
2.078		-19.32				160.1	0.492
2.100		-18.58				162.2	0.492
2.122		-17.98				159.1	0.492
2.144		-17.38				146.1	0.492
2.166		-16.74				134.7	0.492
2.188		-16.22				142.2	0.492
2.210		-15.58				140.5	0.492
2.232		-14.95				111.3	0.492
2.254		-14.24				97.0	0.492
2.275		-13.22				74.6	0.492
2.297		-12.62				51.7	0.492
2.319		-12.26				50.2	0.492
2.341		-12.18				42.6	0.482
2.363		-12.43				18.0	0.482
2.385		-12.86				9.4	0.482
2.407		-13.59				5.5	0.482
2.429		-15.62				12.3	0.482
2.451		-17.18				13.4	0.482
2.473		-18.06				8.7	0.482
2.494		-18.91				9.2	0.482
2.516		-19.68				8.1	0.482
2.538		-20.35				8.4	0.482
2.560		-21.17				10.0	0.482
2.582		-23.05				10.2	0.482
2.604		-23.44				6.4	0.482
2.626		-23.37				6.8	0.482
2.648		-21.66				13.8	0.482
2.670		-19.99				5.2	0.482
2.692		-19.57				5.2	0.482
2.713		-19.12				4.3	0.482
2.735		-18 89				5.6	0.482
2.757		-18.73				13.8	0.482
2.779		-18.67				14.1	0.482
2.801		-19.07				12.0	0.482
2.823		-19.39				6.8	0.482
2.845		-19.85				6.6	0.482
2.866		-20.15				9.3	0.534
2.887		-21.33				6.1	0.534
2.907		-22.14				6.7	0.534
2.928		-22.95				8.2	0.534
2.949		-23.52				7.2	0.534
2.970		-23.68				8.6	0.534
2.991		-23.20				11.2	0.534
3.012		-23.09				11.5	0.534
3.032		-23.02				11.8	0.534
3.053		-23.29				11.7	0.534
3.074		-23.54				15.5	0.534
3.095		-23.83				14.3	0.534
3.116		-23.95				12.3	0.534
3.137		-23.92				12.9	0.534

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^{3}]
3.158		-23.81				16.9	0.534
3.178		-23.59				12.7	0.534
3.199		-23.42				11.5	0.534
3.220		-23.16				14.3	0.534
3.241		-22.96				12.2	0.514
3.262		-22.78				10.1	0.514
3.283		-22.75				10.9	0.514
3.304		-22.77				11.2	0.514
3.324		-22.86				11.8	0.514
3.345		-22.85				13.6	0.514
3.366		-22.91				13.8	0.514
3.387		-22.82				8.4	0.514
3.408		-22.51				9.3	0.514
3.429		-22.07				15.7	0.514
3.450		-21.20				5.7	0.514
3.470		-20.45				6.4	0.514
3.491		-19.41				13.9	0.514
3.512		-18.10				10.6	0.542
3.533		-16.81				9.9	0.542
3.554		-16.63				10.6	0.542
3.575		-16.71				10.0	0.542
3.596		-17.36				8.5	0.542
3.616		-18.12				8.3	0.542
3.637		-19.00				7.6	0.542
3.658		-19.94				6.7	0.542
3.679		-20.85				9.7	0.542
3.700		-21.62				6.9	0.542
3.721		-22.68				4.9	0.516
3.743		-23.55				3.6	0.516
3.765		-24.27				3.8	0.516
3.786		-25.01				9.3	0.516
3.808		-25.59				5.0	0.516
3.830		-26.02				4.4	0.516
3.851		-26.08				4.2	0.516
3.873		-26.13				4.1	0.516
3.894		-25.79				13.4	0.516
3.916		-23.36				24.2	0.516
3.938		-22.21				12.3	0.516
3.959		-21.05				9.3	0.516
3.981		-20.32				7.2	0.516
4.002		-19.41				6.9	0.532
4.024		-18.26				7.0	0.532
4.046		-16.47				15.4	0.532
4.067		-15.13				13.4	0.532
4.089		-14.29				83.3	0.532
4.111		-13.72				125.9	0.532
4.132		-13.44				182.4	0.532
4.154		-13.41				124.5	0.532
4.175		-13.64				56.4	0.532
4.197		-14.09				72.5	0.532
4.219		-14.78				77.0	0.532
4.240		-15.70				50.5	0.532
4.262		-16.43				8.8	0.532
4.284		-18.67				7.2	0.532
4.305		-20.47				5.5	0.657
4.327		-21.14				6.2	0.657
4.348		-21.65				5.2	0.657
4.370		-22.06				4.9	0.657
4.392		-22.29				5.1	0.657
4.413		-22.40				5.8	0.657
4.435		-22.26				5.0	0.657
4.457		-22.34				4.5	0.657
4.478		-22.81				5.4	0.657
4.500		-23.28				5.5	0.657
4.522		-25.09				8.1	0.549
4.544		-25.92				6.5	0.549
4.566		-26.10				9.8	0.549
4.588		-25.54				23.0	0.549
4.610		-23.19				66.0	0.549
4.632		-22.95				71.5	0.549
4.653		-22.77				76.2	0.549

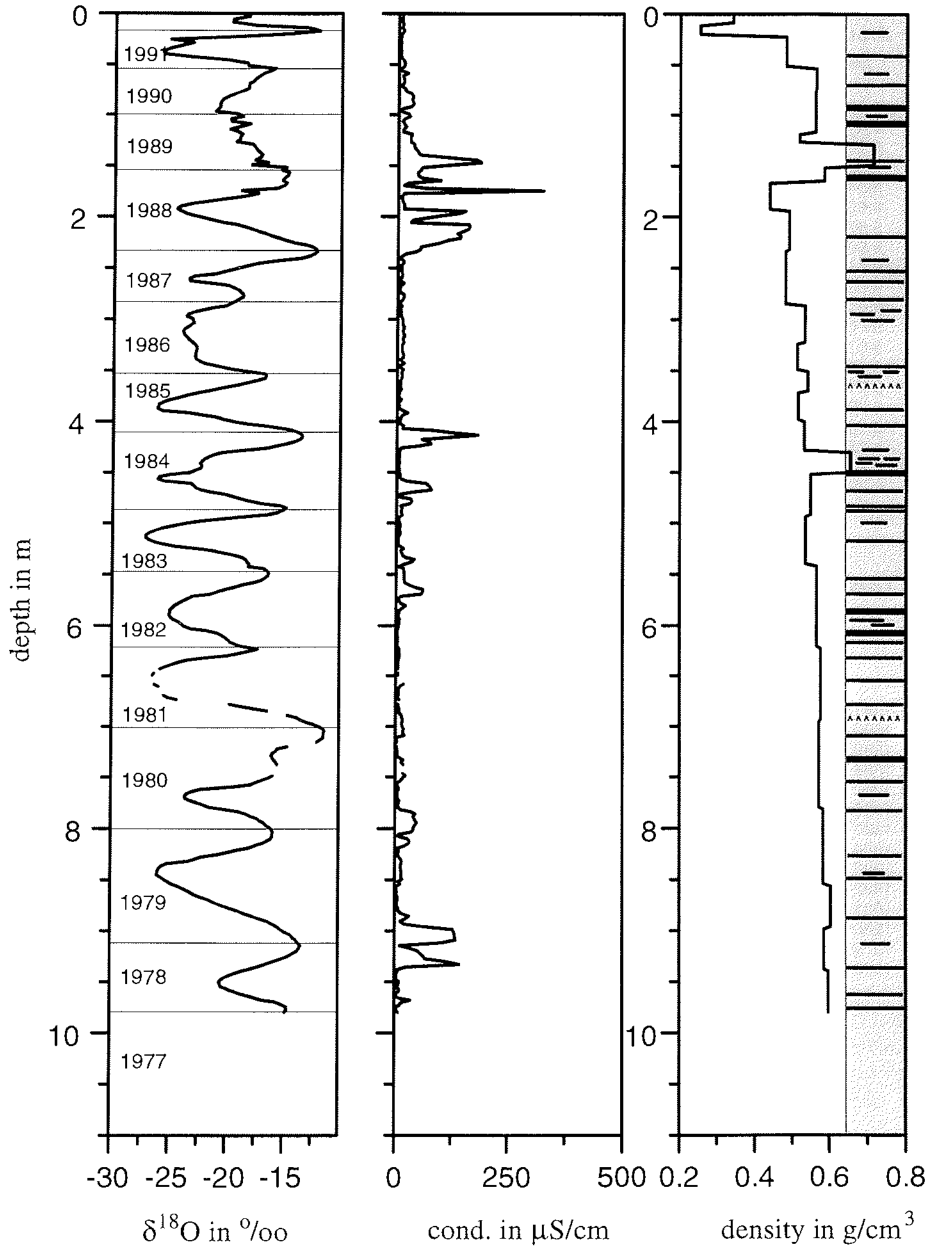
Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
4.675		-22.31				78.1	0.549
4.697		-21.39				34.6	0.549
4.719		-20.15				6.1	0.549
4.741		-19.51				5.0	0.549
4.763		-18.82				31.5	0.549
4.785		-18.00				33.7	0.549
4.807		-17.04				30.5	0.549
4.829		-15.27				9.0	0.549
4.851		-14.80				12.0	0.549
4.873		-15.13				11.0	0.549
4.895		-15.62				9.9	0.549
4.917		-16.46				12.5	0.549
4.939		-18.96				6.1	0.535
4.961		-20.88				4.7	0.535
4.983		-22.62				5.6	0.535
5.005		-23.79				7.9	0.535
5.027		-24.87				8.4	0.535
5.049		-25.74				7.9	0.535
5.071		-26.36				7.2	0.535
5.092		-26.84				8.6	0.535
5.114		-27.11				6.8	0.535
5.136		-27.13				4.2	0.535
5.158		-26.88				4.2	0.535
5.180		-26.36				4.1	0.535
5.202		-25.60				4.3	0.535
5.224		-24.71				7.8	0.535
5.246		-22.56				16.4	0.535
5.268		-21.36				9.6	0.535
5.290		-20.40				11.4	0.535
5.312		-19.41				13.6	0.535
5.334		-18.73				20.2	0.535
5.356		-18.35				41.0	0.535
5.378		-18.25				36.0	0.535
5.400		-18.07				18.9	0.535
5.422		-18.14				4.4	0.565
5.445		-16.75				17.2	0.565
5.467		-16.45				16.9	0.565
5.490		-16.32				18.4	0.565
5.512		-16.41				17.9	0.565
5.535		-16.65				17.8	0.565
5.557		-16.99				18.1	0.565
5.580		-17.61				19.5	0.565
5.602		-18.70				29.2	0.565
5.625		-19.38				42.7	0.565
5.647		-20.12				59.7	0.565
5.670		-20.83				59.8	0.565
5.692		-21.38				56.7	0.565
5.715		-23.01				10.6	0.565
5.737		-23.51				6.4	0.565
5.760		-23.89				6.8	0.565
5.782		-24.22				10.6	0.565
5.805		-24.58				21.5	0.565
5.827		-24.75				15.3	0.565
5.850		-25.00				8.1	0.565
5.872		-25.00				7.1	0.565
5.895		-25.04				5.7	0.565
5.917		-24.95				5.9	0.565
5.940		-24.72				8.1	0.565
5.962		-24.29				7.3	0.565
5.985		-24.02				7.3	0.565
6.007		-23.76				5.9	0.565
6.030		-23.23				5.3	0.565
6.052		-21.77				3.4	0.565
6.075		-20.87				3.9	0.565
6.097		-20.48				3.6	0.565
6.120		-20.14				4.2	0.565
6.142		-19.88				4.1	0.565
6.165		-19.68				4.1	0.565
6.187		-19.23				2.9	0.565
6.210		-18.62				3.4	0.565
6.232		-17.26				8.2	0.576

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm³]
6.254		-17.98				7.5	0.576
6.276		-18.87				8.0	0.576
6.298		-19.91				8.5	0.576
6.320		-21.82				8.1	0.576
6.342		-23.47				6.0	0.576
6.364		-24.15				5.7	0.576
6.386		-24.76				6.0	0.576
6.408		-25.36				5.7	0.576
6.430		-25.81				5.7	0.576
6.451							0.576
6.473		-26.32				5.7	0.576
6.495		-26.45				5.6	0.576
6.517							0.576
6.539		-26.65				5.8	0.576
6.561							0.576
6.583		-26.34				18.1	0.576
6.605		-25.95				9.3	0.576
6.627						7.5	0.576
6.649		-25.79				7.1	0.576
6.671						7.0	0.576
6.693		-25.49				6.9	0.576
6.715		-25.10				4.3	0.576
6.737		-24.38				8.4	0.576
6.759							0.576
6.781		-19.73				5.2	0.576
6.803		-18.73				6.6	0.576
6.825		-17.51				8.7	0.576
6.847		-16.40				7.8	0.576
6.869						8.7	0.576
6.891		-14.60				13.9	0.576
6.913		-13.79				14.1	0.576
6.935		-13.50				16.3	0.576
6.957		-13.01				15.5	0.572
6.979		-12.35				14.5	0.572
7.001		-11.82				15.4	0.572
7.023		-11.48				18.3	0.572
7.045		-11.36				17.4	0.572
7.067		-11.44				17.2	0.572
7.089		-11.46				20.0	0.572
7.111		-11.46				2.8	0.572
7.133		-11.72				2.4	0.572
7.155		-12.02				3.5	0.572
7.177							0.572
7.199		-14.62				3.2	0.572
7.221		-15.52				3.4	0.572
7.244		-15.65				3.7	0.572
7.266		-15.91				4.3	0.572
7.288		-16.01				4.2	0.572
7.310		-15.94				8.3	0.572
7.332		-15.80				17.5	0.572
7.354		-15.63				13.2	0.572
7.376		-15.52				17.6	0.572
7.398							0.572
7.420		-15.54				17.4	0.572
7.442							0.572
7.464						17.3	0.572
7.486		-15.90				22.8	0.572
7.508		-16.27				17.7	0.572
7.530		-16.81				13.7	0.572
7.552		-17.32				6.7	0.572
7.574		-17.83				4.7	0.572
7.596		-19.40				7.1	0.572
7.618		-22.28				8.3	0.572
7.640		-22.96				5.9	0.572
7.662		-23.40				5.2	0.572
7.685		-23.59				5.2	0.572
7.707		-23.56				5.7	0.572
7.729		-23.13				9.1	0.572
7.751		-22.49				7.2	0.572
7.773		-21.94				7.1	0.572
7.795		-21.39				8.2	0.572

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
7.817		-20.06				12.5	0.583
7.839		-18.85				36.3	0.583
7.861		-18.23				45.6	0.583
7.882		-17.81				41.1	0.583
7.904		-17.32				42.6	0.583
7.926		-17.03				45.4	0.583
7.948		-16.68				48.8	0.583
7.970		-16.47				45.2	0.583
7.992		-16.17				41.6	0.583
8.014		-15.97				42.0	0.583
8.036		-15.88				36.9	0.583
8.058		-15.92				9.0	0.583
8.080		-15.93				8.4	0.583
8.102		-16.02				27.4	0.583
8.123		-16.33				32.1	0.583
8.145		-16.79				31.7	0.583
8.167		-17.40				23.6	0.583
8.189		-17.92				8.5	0.583
8.211		-19.01				8.9	0.583
8.233		-19.81				8.1	0.583
8.255		-20.78				6.1	0.583
8.277		-22.10				9.5	0.583
8.299		-22.66				12.8	0.583
8.321		-23.22				16.1	0.583
8.343		-25.11				15.0	0.583
8.365		-25.57				13.4	0.583
8.386		-25.80				13.0	0.583
8.408		-25.91				14.0	0.583
8.430		-25.95				15.2	0.583
8.452		-25.99				14.2	0.583
8.474		-25.71				14.0	0.583
8.496		-25.36				17.0	0.583
8.518		-25.09				8.6	0.583
8.540		-24.71				12.0	0.583
8.566		-24.12				4.7	0.604
8.592		-23.66				4.3	0.604
8.619		-23.18				4.6	0.604
8.645		-22.75				4.2	0.604
8.671		-22.16				7.0	0.604
8.697		-21.51				6.1	0.604
8.724		-20.95				5.1	0.604
8.750		-20.39				4.9	0.604
8.776		-19.74				7.8	0.604
8.802		-18.99				7.8	0.604
8.829		-18.41				15.5	0.604
8.855		-17.68				32.5	0.604
8.881		-17.02				24.4	0.604
8.907		-16.37				12.9	0.604
8.934		-15.86				21.7	0.604
8.960		-15.45				66.0	0.604
8.986		-15.16				129.9	0.586
9.012		-14.80				132.2	0.586
9.039		-14.30				134.7	0.586
9.065		-14.10				134.7	0.586
9.091		-13.81				136.6	0.586
9.117		-13.65				105.2	0.586
9.144		-13.40				11.5	0.586
9.170		-13.52				34.9	0.586
9.196		-13.69				51.9	0.586
9.222		-14.06				57.2	0.586
9.249		-14.48				64.7	0.586
9.275		-15.04				68.1	0.586
9.301		-15.75				111.5	0.586
9.327		-16.48				144.7	0.586
9.354		-17.23				26.5	0.586
9.380		-18.02				6.1	0.586
9.396		-18.57				8.3	0.598
9.413		-19.06				4.8	0.598
9.430		-19.47				4.7	0.598
9.446		-19.85				5.0	0.598
9.463		-20.13				4.1	0.598

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm³]
9.479		-20.34				3.9	0.598
9.496		-20.49				10.5	0.598
9.513		-20.52				9.8	0.598
9.529		-20.42				8.5	0.598
9.546		-20.37				7.6	0.598
9.562		-20.00				8.2	0.598
9.579		-19.71				11.3	0.598
9.596		-19.22				9.5	0.598
9.612		-18.84				4.1	0.598
9.629		-18.36				4.0	0.598
9.645		-17.86				4.1	0.598
9.662		-17.30				11.4	0.598
9.679		-16.76				35.3	0.598
9.695		-15.63				19.9	0.598
9.712		-15.26				13.0	0.598
9.728		-14.93				11.7	0.598
9.745		-14.63				4.8	0.598
9.762		-14.62				4.9	0.598
9.778		-14.61				5.3	0.598
9.795		-14.78				7.7	0.598

Year	Layer thickness [m]	mean ^{18}O [‰]	mean ^2H [‰]	mean ^3H [TU]	annual accumulation [mm w.e.]
1991	0.368	-21.56			174
1990	0.475	-19.09			268
1989	0.555	-17.93			344
1988	0.772	-18.09			372
1987	0.438	-18.82			211
1986	0.775	-21.98			405
1985	0.600	-20.36			316
1984	0.675	-20.59			392
1983	0.661	-21.14			357
1982	0.742	-21.52			419
1981	0.813	-20.29			468
1980	0.991	-17.39			569
1979	1.108	-19.77			655
1978	0.635	-17.22			377



Shallow firn core, FB0192, Neumayer Station, March 1992

Neumayer Station

70°39'31"S 8°15'9"W
11.03.95
10.80m
FB0595

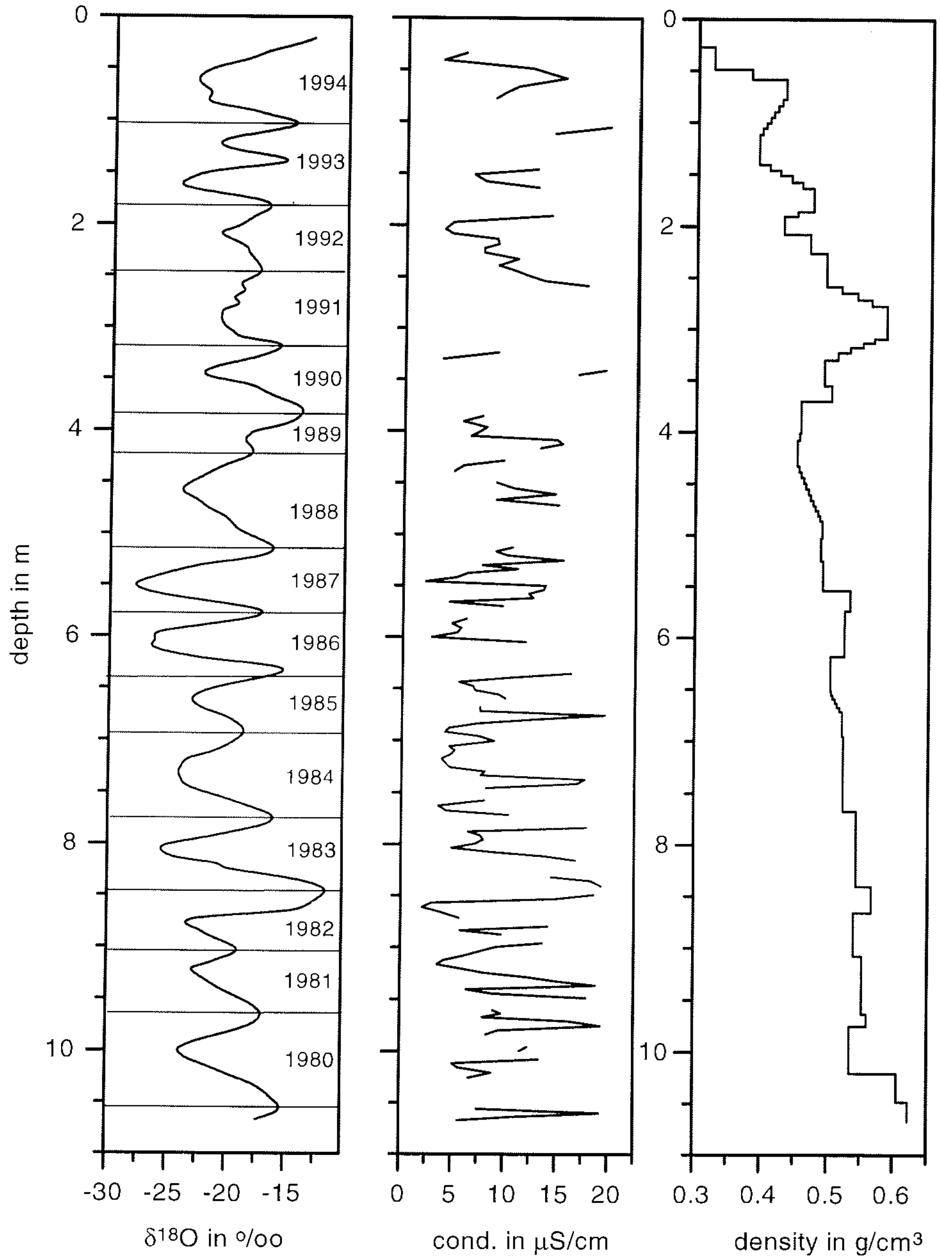
Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
0.210		-13.2					0.300
0.273		-14.7					0.300
0.340		-17.4				5.7	0.323
0.410		-18.3				3.5	0.323
0.490		-21.8				12.2	0.323
0.585		-23.2				15.4	0.380
0.663		-22.9				10.8	0.432
0.720		-21.8				9.6	0.432
0.780		-22.1				8.6	0.432
0.840		-22.4					0.426
0.898		-18.4					0.420
0.953		-17.1					0.414
1.005		-14.6					0.409
1.055		-14.4				19.7	0.403
1.118		-17.5				14.4	0.397
1.190		-21.2					0.392
1.250		-21.1					0.392
1.300		-19.4					0.392
1.350		-16.1					0.392
1.405		-14.6					0.392
1.460		-19.8				12.7	0.408
1.510		-22.8				6.6	0.424
1.573		-23.9				7.7	0.441
1.635		-24.9				12.8	0.457
1.698		-21.4					0.474
1.760		-17.5					0.474
1.810		-16.7					0.474
1.858		-16.8					0.474
1.905		-17.9				14.1	0.450
1.970		-18.7				4.6	0.430
2.035		-19.7				3.8	0.430
2.080		-21.3				4.5	0.430
2.130		-20.4				8.9	0.469
2.180						9.0	0.469
2.220		-18.6				7.6	0.469
2.263		-18.7				7.6	0.469
2.325		-18.2				10.9	0.493
2.390						9.0	0.493
2.440		-17.4				10.6	0.493
2.490		-17.7				11.9	0.493
2.540		-18.7				13.5	0.493
2.588		-19.5				17.6	0.493
2.650		-18.5					0.516
2.715		-20.3					0.540
2.775		-18.9				11.5	0.564
2.830		-20.9					0.587
2.870		-20.8					0.587
2.913		-21.0					0.587
2.958							0.587
3.003		-20.6					0.587
3.050		-19.7					0.587
3.095		-19.7					0.587
3.135		-17.2					0.568
3.178		-14.9					0.549
3.233							0.530
3.303		-17.8				3.7	0.511
3.363		-20.5					0.491
3.408		-21.9				19.4	0.491
3.453		-22.5				16.8	0.491
3.498		-21.7					0.491

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^{3}]
3.553		-18.3					0.491
3.608		-17.5					0.502
3.655		-16.7					0.502
3.705		-15.6					0.502
3.755		-14.3					0.457
3.805		-13.8					0.457
3.855		-14.0				7.6	0.457
3.905		-14.5				5.7	0.457
3.963		-15.8				8.0	0.457
4.013		-18.2				7.2	0.457
4.048		-18.3				6.5	0.455
4.085		-18.8				14.8	0.455
4.125		-18.6				15.3	0.452
4.165		-18.2				13.2	0.452
4.205		-18.0					0.452
4.245		-18.2					0.452
4.285		-19.0				9.7	0.452
4.333		-20.3				5.8	0.452
4.388		-21.3				4.9	0.455
4.443		-22.2					0.458
4.498							0.462
4.553		-24.1				10.7	0.465
4.608		-24.0				14.7	0.469
4.663		-22.8				9.0	0.472
4.715		-22.3				15.0	0.476
4.765		-21.7					0.479
4.813		-20.7					0.483
4.863		-20.1					0.486
4.910		-19.7					0.490
4.950		-19.4				8.7	0.490
4.990		-18.8					0.490
5.030							0.490
5.078		-17.0					0.488
5.125		-16.2				10.6	0.488
5.165		-16.2				9.0	0.488
5.205		-16.7				10.0	0.488
5.253		-18.6				15.5	0.488
5.300		-22.1				7.7	0.491
5.340		-23.5				11.1	0.491
5.380		-24.9				6.3	0.491
5.420		-26.1				5.2	0.491
5.460		-27.3				2.2	0.491
5.500		-28.0				13.8	0.491
5.540		-27.6				13.6	0.491
5.580		-26.5				12.2	0.532
5.620		-24.5				12.6	0.532
5.660		-21.9				4.5	0.532
5.700		-19.4				9.7	0.532
5.740		-17.3					0.532
5.780		-17.0					0.524
5.823		-17.8				6.2	0.524
5.868		-20.6				4.8	0.524
5.913		-23.1				5.7	0.524
5.958		-26.1				5.3	0.524
6.003		-26.3				2.8	0.524
6.048		-26.1				11.9	0.524
6.093		-26.7					0.524
6.138		-25.9					0.524
6.183		-24.0					0.524
6.228		-21.5					0.503
6.273		-16.9				18.4	0.503
6.315		-15.1					0.503
6.355		-15.4				16.3	0.503
6.395		-16.7				10.5	0.503
6.435		-18.5				5.5	0.503
6.475		-20.2				6.9	0.503
6.515		-21.6				7.1	0.503
6.555		-22.5				9.4	0.504
6.595		-23.0				10.0	0.506
6.635		-23.0					0.510
6.675		-22.5				7.6	0.513

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
6.715		-21.8				7.6	0.517
6.755		-20.6				19.6	0.521
6.795		-19.8				13.1	0.521
6.835		-19.2				7.4	0.521
6.875		-18.7				4.6	0.521
6.915		-18.6				4.2	0.521
6.955		-18.6				7.5	0.521
7.005							0.523
7.055		-20.0				4.6	0.523
7.095		-20.8				5.2	0.523
7.135		-21.7				4.8	0.523
7.175		-23.3				3.9	0.523
7.215		-23.7				4.3	0.523
7.255		-23.9				4.7	0.523
7.295		-24.1				8.1	0.523
7.335		-24.1				7.7	0.523
7.375		-23.9				17.7	0.523
7.415		-23.8				17.0	0.523
7.455		-23.2				8.2	0.523
7.495		-22.2					0.523
7.535		-20.9					0.523
7.575		-19.8				8.1	0.523
7.625		-18.4				3.6	0.523
7.675		-17.2				4.4	0.523
7.715		-16.2				10.4	0.543
7.755		-16.0					0.543
7.795		-16.3					0.543
7.835		-17.3				17.9	0.543
7.875		-19.0				6.5	0.543
7.915		-20.5				7.7	0.543
7.955		-22.3				8.0	0.543
7.995		-24.3				7.2	0.543
8.035		-25.9				4.9	0.543
8.075						9.0	0.543
8.115		-25.1				13.9	0.543
8.155		-23.7				16.8	0.543
8.195		-20.3					0.543
8.235		-20.6					0.543
8.275		-18.1					0.543
8.315		-15.7				14.5	0.543
8.355		-13.7				18.3	0.543
8.403		-12.1				19.3	0.543
8.450		-11.5					0.567
8.490		-11.7				18.6	0.567
8.530		-12.2				14.9	0.567
8.570		-12.7				3.0	0.567
8.610		-13.3				2.1	0.567
8.660		-14.3				3.9	0.567
8.713		-22.4				5.7	0.539
8.755		-23.5					0.539
8.795		-23.3				14.2	0.539
8.835		-22.3				5.8	0.539
8.875		-21.8				9.8	0.539
8.915		-21.0					0.539
8.955		-20.1				13.7	0.539
8.995		-19.3				9.3	0.539
9.035		-18.9				7.8	0.539
9.078		-19.4				6.2	0.539
9.123		-20.7				4.2	0.552
9.165		-21.5				3.6	0.552
9.205		-23.0				5.9	0.552
9.245		-22.8				8.1	0.552
9.285						12.2	0.552
9.325		-21.6				15.3	0.552
9.365		-21.1				18.8	0.552
9.405		-20.5				6.4	0.552
9.445							0.552
9.485		-19.0				17.9	0.552
9.525		-18.2					0.552
9.565		-17.6					0.552
9.601							0.552

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^{3}]
9.632		-16.9				9.8	0.552
9.667		-17.0				8.0	0.560
9.707		-17.2				16.3	0.560
9.752		-17.8				19.3	0.560
9.797		-18.9				9.5	0.534
9.837		-20.2				8.4	0.534
9.877		-21.5					0.534
9.917		-22.7					0.534
9.957		-23.5				12.3	0.534
9.997		-24.1				11.6	0.534
10.037		-23.7					0.534
10.077		-23.3				13.4	0.534
10.117		-22.3				5.1	0.534
10.157		-21.4				5.7	0.534
10.207		-20.3				8.9	0.534
10.257		-19.2				6.7	0.605
10.297		-18.2					0.605
10.337		-17.4					0.605
10.377		-16.9				7.3	0.605
10.417		-16.4					0.605
10.452		-16.1					0.605
10.482		-15.8					0.605
10.517		-15.4					0.622
10.557		-15.3				7.5	0.622
10.597		-15.5				19.2	0.622
10.635		-16.4				10.9	0.622
10.670		-17.3				5.7	0.622

Year	Layer thickness [m]	mean ^{18}O [‰]	mean ^{2}H [‰]	mean ^{3}H [TU]	annual accumulation [mm w.e.]
1993	0.755	-17.93			356
1992	0.630	-15.93			292
1991	0.735	-17.91			406
1990	0.630	-16.14			312
1989	0.495	-16.31			225
1988	0.920	-18.49			435
1987	0.655	-22.24			331
1986	0.535	-22.62			278
1985	0.600	-20.14			307
1984	0.840	-19.56			441
1983	0.695	-17.88			378
1982	0.585	-18.14			321
1981	0.592	-16.45			326
1980	0.930	-19.26			526



Shallow firn core FB9505, Neumayer Station, March 1995

Ekström Traverse, km2

70°37'S 8°22'W
1986/87
10.13m
E002

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
0.014	-143.1	-18.57	5.5			50.1	0.398
0.043	-146.4	-18.91	4.9			47.0	0.398
0.071	-145.9	-18.61	3.0			50.7	0.398
0.099	-147.3	-19.22	6.4			54.6	0.398
0.127	-150.0	-19.02	2.2			56.8	0.398
0.156	-149.6	-19.34	5.1			42.8	0.398
0.205	-180.4	-22.74	1.5			16.1	0.477
0.235	-194.0	-24.18	-0.6			14.3	0.477
0.265	-188.4	-23.85	2.4			17.7	0.477
0.295	-180.0	-22.96	3.7			25.8	0.477
0.325	-177.4	-22.58	3.2			28.9	0.477
0.355	-174.5	-22.42	4.9			30.5	0.477
0.385	-171.1	-22.03	5.1			25.7	0.477
0.415	-170.7	-21.45	0.9			22.0	0.477
0.445	-162.3	-20.34	0.4			66.4	0.477
0.475	-155.8	-19.56	0.7			131.5	0.477
0.505	-149.4	-19.03	2.8			210.0	0.477
0.535	-146.0	-18.72	3.8			341.0	0.477
0.565	-145.2	-17.97	-1.4			323.0	0.477
0.595	-146.9	-18.24	-1.0			311.0	0.477
0.625	-146.9	-18.14	-1.8			299.0	0.477
0.650	-146.2	-18.67	3.2			298.0	0.477
0.670	-146.0	-18.44	1.5			293.0	0.477
0.715	-135.7	-17.28	2.5			25.4	0.386
0.745	-130.1	-16.00	-2.1			93.1	0.386
0.775	-123.5	-15.28	-1.3			567.0	0.386
0.813	-120.7	-15.08	-0.1			140.0	0.386
0.870	-134.9	-17.05	1.5			25.7	0.417
0.900	-161.2	-20.14	-0.1			33.1	0.417
0.930	-179.9	-22.53	0.3			25.2	0.417
0.960	-193.2	-24.15	0.0			24.8	0.417
0.990	-201.3	-25.59	3.4			25.2	0.417
1.020	-205.7	-25.95	1.9			16.8	0.417
1.050	-210.1	-26.61	2.8			15.4	0.417
1.080	-212.4	-27.13	4.6			15.0	0.417
1.110	-212.8	-27.17	4.6			14.3	0.417
1.140	-211.3	-26.73	2.5			12.7	0.417
1.170							0.417
1.202	-194.4	-25.05	6.0			119.1	0.417
1.255	-169.4	-22.14	7.7			276.0	0.434
1.285	-162.2	-21.03	6.0			199.0	0.434
1.315	-135.0	-17.72	6.8			195.0	0.434
1.345	-129.7	-16.60	3.1			192.0	0.434
1.375	-131.2	-16.74	2.7			196.0	0.434
1.405	-134.7	-17.49	5.2			122.0	0.434
1.435	-149.6	-18.77	0.6			15.6	0.434
1.465	-165.0	-20.59	-0.3			15.5	0.434
1.490	-170.3	-22.00	5.7			21.4	0.434
1.510	-176.2	-22.61	4.7			21.5	0.434
1.555	-167.7	-21.59	5.0			73.5	0.494
1.585	-143.1	-17.93	0.3			120.1	0.494
1.615	-140.8	-17.57	-0.2			126.0	0.494
1.645	-138.2	-17.45	1.4			155.9	0.494
1.675	-135.5	-17.20	2.1			226.0	0.494
1.705	-131.5	-16.54	0.8			405.0	0.494
1.735	-124.4	-16.09	4.3			246.0	0.494
1.765	-121.9	-15.72	3.9			203.0	0.494
1.795	-119.0	-15.49	4.9			208.0	0.494
1.825	-117.1	-15.31	5.4			211.0	0.494

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
1.855	-117.5	-14.90	1.7			211.0	0.494
1.880	-111.5	-14.56	5.0			130.0	0.494
1.926							0.443
1.959	-109.5	-13.85	1.3			115.7	0.443
1.987	-106.1	-13.34	0.6			115.4	0.443
2.013	-100.4	-12.95	3.2			110.4	0.443
2.055	-94.5	-11.81	0.0			32.8	0.433
2.085	-86.0	-11.29	4.3			14.4	0.433
2.115	-89.5	-11.67	3.9			14.6	0.433
2.140	-92.2	-11.85	2.6			14.2	0.433
2.158	-95.1	-12.33	3.5			15.0	0.433
2.100	-137.8	-16.95	-2.2			28.7	0.451
2.210	-147.4	-19.09	5.3			129.1	0.451
2.240	-154.5	-19.51	1.6			147.4	0.451
2.270	-154.8	-19.77	3.4			147.3	0.451
2.300	-150.9	-19.16	2.4			158.4	0.451
2.330	-145.7	-18.85	5.1			859.0	0.451
2.360	-141.4	-18.02	2.8			332.0	0.451
2.390	-136.3	-17.49	3.6			341.0	0.451
2.420	-134.5	-17.37	4.5			335.0	0.451
2.450	-133.8	-17.33	4.8			328.0	0.451
2.480	-133.6	-17.31	4.9			305.0	0.451
2.510	-134.5	-17.35	4.3			283.0	0.451
2.540	-136.6	-17.59	4.1			75.9	0.451
2.570	-139.8	-17.88	3.2			11.8	0.451
2.600	-148.4	-18.49	-0.5			9.6	0.451
2.630	-155.9	-19.72	1.9			10.1	0.451
2.660	-170.8	-21.31	-0.3			11.8	0.459
2.690	-178.5	-22.74	3.4			18.6	0.459
2.720	-183.6	-23.45	4.0			20.5	0.459
2.750	-183.8	-23.70	5.8			26.4	0.459
2.777	-185.9	-23.71	3.8			42.1	0.459
2.804	-186.0	-23.77	4.2			60.6	0.490
2.832	-185.8	-23.68	3.6			54.1	0.490
2.859	-185.9	-23.58	2.7			56.5	0.490
2.887	-184.0	-23.52	4.1			61.7	0.490
2.915	-181.8	-23.50	6.2			76.0	0.490
2.943	-180.0	-22.82	2.6			77.4	0.490
2.970	-176.6	-22.67	4.8			71.4	0.490
2.998	-169.9	-21.61	3.0			85.8	0.490
3.026	-161.0	-20.74	4.9			195.0	0.490
3.053	-152.9	-19.84	5.8			243.0	0.490
3.081	-149.7	-19.17	3.7			246.0	0.490
3.109	-142.4	-18.23	3.4			252.0	0.490
3.137	-138.6	-17.86	4.3			250.0	0.490
3.164	-135.0	-17.39	4.1			267.0	0.490
3.192	-132.0	-16.97	3.8			286.0	0.490
3.220	-128.8	-17.07	7.8			292.0	0.490
3.247	-125.6	-16.06	2.9			132.0	0.490
3.275	-122.8	-15.59	1.9			39.0	0.490
3.303	-118.7	-15.04	1.6			36.9	0.490
3.331	-114.4	-14.77	3.8			30.8	0.490
3.358	-111.2	-14.40	4.0			22.7	0.490
3.386	-110.3	-14.38	4.7			32.5	0.490
3.414	-112.0	-14.12	1.0			13.0	0.421
3.441	-114.8	-14.66	2.5			16.7	0.421
3.469	-123.3	-15.56	1.2			17.7	0.421
3.492	-146.9	-18.61	2.0			26.2	0.421
3.511	-157.3	-19.94	2.2			28.9	0.421
3.533	-167.7	-21.24	2.2			39.7	0.506
3.560	-174.7	-21.83	-0.1			18.0	0.506
3.587	-181.8	-23.08	2.8			37.4	0.506
3.614	-186.1	-23.31	0.4			45.2	0.506
3.641	-185.5	-23.44	2.0			49.3	0.506
3.668	-176.9	-22.02	-0.7			90.7	0.506
3.694	-162.0	-20.55	2.4			158.6	0.506
3.721	-152.4	-19.58	4.2			274	0.506
3.748	-142.5	-18.39	4.6			278	0.506
3.775	-134.0	-17.60	6.8			281	0.506
3.802	-128.3	-16.87	6.7			287	0.506
3.829	-124.2	-16.16	5.1			286	0.506

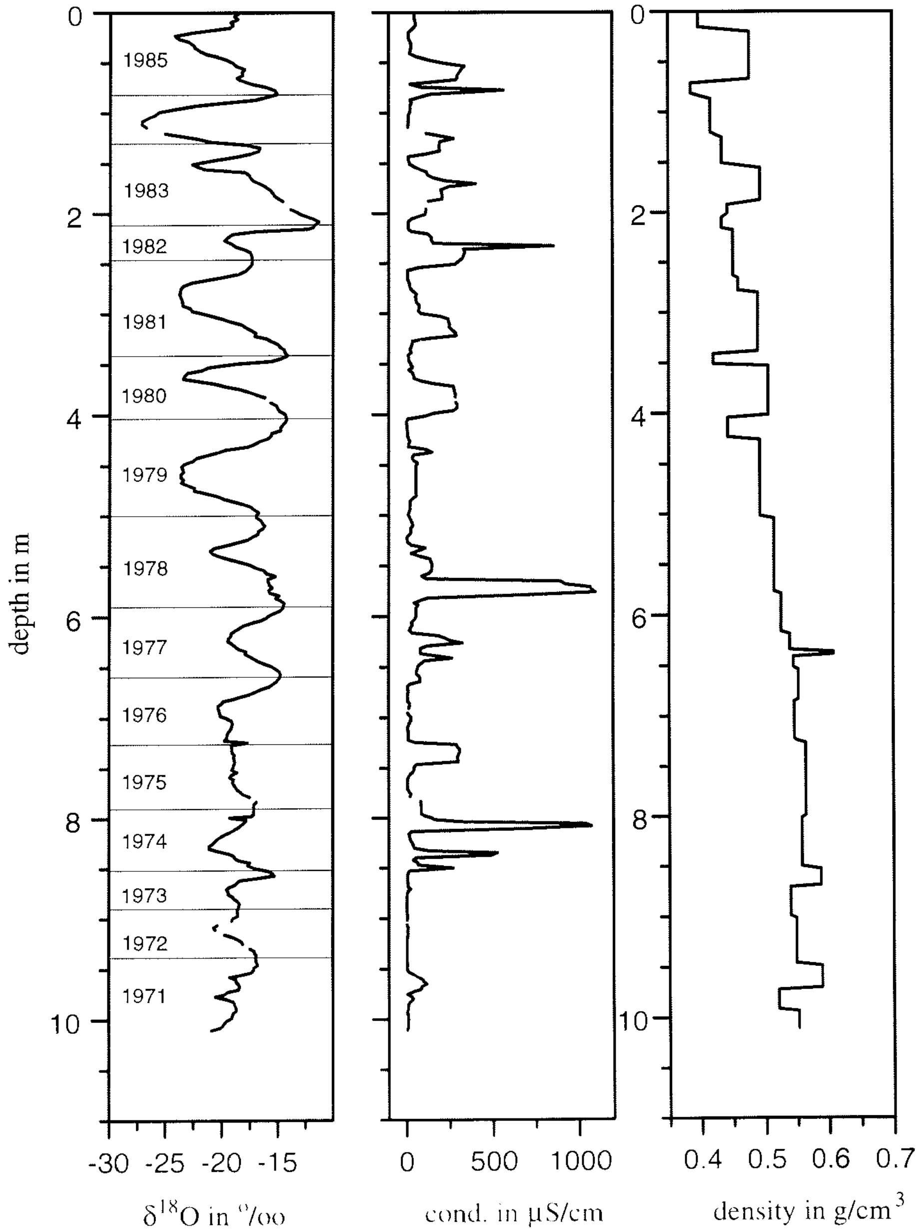
Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
3.855							0.506
3.882	-118.7	-15.63	6.3			288	0.506
3.909	-117.2	-15.11	3.7			298	0.506
3.936	-115.6	-15.04	4.7			296	0.506
3.963	-113.7	-14.85	5.1			274	0.506
3.990	-110.8	-14.38	4.2			153	0.506
4.017	-110.0	-14.25	4.0			109.7	0.506
4.044	-107.5	-14.18	5.9			9.5	0.443
4.071	-110.3	-14.29	4.0			4.9	0.443
4.099	-113.3	-14.52	2.8			5.0	0.443
4.126	-113.6	-14.71	4.1			8.0	0.443
4.154	-115.6	-14.71	2.1			6.8	0.443
4.181	-120.5	-15.54	3.8			9.9	0.443
4.209	-120.3	-15.58	4.3			11.8	0.443
4.236	-124.6	-15.88	2.4			13.4	0.443
4.264	-129.0	-16.60	3.8			23.3	0.492
4.291	-132.9	-17.12	4.1			16.4	0.492
4.318	-136.4	-17.75	5.6			16.2	0.492
4.345	-150.0	-19.68	7.4			117.2	0.492
4.372	-159.8	-20.44	3.7			150	0.492
4.399	-166.8	-21.34	3.9			46.2	0.492
4.426	-175.9	-22.26	2.2			36.8	0.492
4.453	-180.1	-22.55	0.3			43.0	0.492
4.480	-184.1	-23.26	2.0			67.4	0.492
4.507	-184.3	-23.58	4.3			57.2	0.492
4.534	-185.7	-23.50	2.3			56.8	0.492
4.561	-188.0	-23.38	-1.0			56.8	0.492
4.588	-186.3	-23.62	2.7			57.1	0.492
4.615	-187.0	-23.64	2.1			57.1	0.492
4.643	-186.1	-23.39	1.0			57.2	0.492
4.67	-183.9	-23.61	5.0			57.1	0.492
4.697	-183.1	-23.02	1.1			56.7	0.492
4.724	-180.4	-22.45	-0.8			56.7	0.492
4.751	-175.3	-22.47	4.5			56.9	0.492
4.778	-169.2	-21.36	1.7			56.8	0.492
4.805	-161.0	-20.37	2.0			61.4	0.492
4.832	-154.6	-19.87	4.4			39.2	0.492
4.859	-147.2	-18.94	4.3			22.5	0.492
4.886	-141.3	-18.10	3.5			23.7	0.492
4.913	-135.4	-17.41	3.9			23.5	0.492
4.940	-131.9	-17.07	4.7			23.7	0.492
4.968	-130.6	-16.68	2.8			19.1	0.492
4.993	-131.3	-16.90	3.9			13.4	0.492
5.017	-132.0	-16.90	3.2			19.7	0.492
5.044	-130.8	-16.53	1.4			26.1	0.515
5.072	-129.6	-16.37	1.4			35.4	0.515
5.099	-126.2	-16.16	3.1			38.7	0.515
5.127	-127.4	-16.35	3.4			28.7	0.515
5.155	-127.0	-16.72	6.7			27.6	0.515
5.183	-129.8	-16.76	4.3			25.0	0.515
5.211	-132.6	-17.28	5.6			7.5	0.515
5.238	-137.2	-17.67	4.2			5.8	0.515
5.266	-144.6	-18.65	4.6			10.7	0.515
5.294	-152.0	-19.62	5.0			31.3	0.515
5.322	-162.1	-20.74	3.8			110.7	0.515
5.349	-164.4	-21.01	3.7			72.0	0.515
5.377	-162.7	-20.79	3.6			30.1	0.515
5.405	-156.7	-20.16	4.6			78.1	0.515
5.433	-147.8	-19.28	6.4			139.8	0.515
5.461	-139.7	-18.31	6.8			144	0.515
5.488	-133.2	-17.50	6.8			150.4	0.515
5.516	-128.4	-16.96	7.3			149.6	0.515
5.544	-121.7	-16.23	8.1			148.9	0.515
5.572	-120.1	-16.01	8.0			132.5	0.515
5.599	-120.8	-15.20	0.8			91.4	0.515
5.627	-119.9	-15.86	7.0			118.4	0.515
5.655	-119.6	-15.83	7.0			899.0	0.515
5.683	-121.1	-15.74	4.8			923.0	0.515
5.711	-121.0	-15.50	3.0			1069.0	0.515
5.738	-122.8	-15.79	3.5			1077.0	0.515
5.766	-120.4	-15.71	5.3			1100.0	0.515

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm³]
5.792	-118.1	-14.87	0.9			661.0	0.526
5.817	-115.9	-15.17	5.5			124.3	0.526
5.841	-114.3	-14.73	3.6			87.6	0.526
5.866	-114.7	-14.43	0.7			45.3	0.526
5.890	-112.2	-14.46	3.5			70.0	0.526
5.915	-114.9	-14.52	1.3			58.4	0.526
5.939	-115.9	-14.74	2.0			58.4	0.526
5.964	-117.2	-15.22	4.6			58.7	0.526
5.989	-121.0	-15.75	5.0			57.4	0.526
6.013	-126.2	-16.01	1.9			56.1	0.526
6.038	-129.3	-16.53	2.9			45.1	0.526
6.062	-137.1	-17.33	1.5			31.8	0.526
6.087	-141.8	-17.99	2.1			35.9	0.526
6.111	-145.8	-18.38	1.2			28.6	0.526
6.136	-149.3	-18.77	0.9			20.3	0.526
6.164	-152.3	-19.13	0.7			36.0	0.526
6.193	-152.1	-19.18	1.3			192.2	0.539
6.218	-153.8	-19.40	1.4			226.0	0.539
6.242	-151.7	-19.44	3.8			260.0	0.539
6.267	-149.4	-19.10	3.4			326.0	0.539
6.293	-146.0	-18.80	4.4			119.0	0.539
6.318	-142.8	-18.52	5.4			84.3	0.539
6.343	-140.3	-17.84	2.4			82.5	0.539
6.366	-138.1	-17.89	5.0			84.8	0.610
6.389	-113.1	-17.51	27			175.8	0.610
6.412	-135.1	-17.14	2.0			265.0	0.546
6.438	-131.5	-16.70	2.1			108.0	0.546
6.463	-127.8	-16.20	1.8			86.6	0.546
6.488	-126.5	-15.57	-2.0			71.1	0.546
6.515	-120.0	-15.17	1.4			66.3	0.546
6.543	-115.8	-14.81	2.6			60.5	0.553
6.568	-113.3	-14.72	4.5			61.0	0.553
6.593	-114.3	-14.74	3.6			77.8	0.553
6.617	-116.1	-14.92	3.3			80.8	0.553
6.642	-119.1	-15.09	1.6			81.1	0.553
6.668	-122.6	-15.43	0.8			21.6	0.553
6.693	-126.3	-15.75	-0.3			9.3	0.553
6.718	-130.3	-16.52	1.9			9.7	0.553
6.742	-135.9	-16.92	-0.5			12.6	0.553
6.767	-140.1	-17.51	0.0			9.9	0.553
6.793	-145.7	-18.34	1.0			8.5	0.553
6.815	-150.0	-19.04	2.3			9.8	0.553
6.835	-155.0	-19.82	3.5			8.7	0.553
6.857	-157.5	-20.00	2.5			19.7	0.546
6.882	-159.2	-20.31	3.3			21.6	0.546
6.906	-160.0	-20.30	2.4			17.2	0.546
6.930	-159.7	-20.21	2.0				0.546
6.955	-155.6	-20.14	5.5			11.9	0.546
6.979	-156.1	-20.11	4.8			19.4	0.546
7.003	-153.0	-19.55	3.4			31.3	0.546
7.028	-149.3	-19.12	3.7			28.7	0.546
7.052	-146.0	-19.04	6.3			19.8	0.546
7.077	-146.3	-19.07	6.3			13.9	0.546
7.101	-146.1	-19.15	7.1			8.7	0.546
7.125	-149.3	-19.28	4.9			11.8	0.546
7.150	-149.4	-19.43	6.0			12.5	0.546
7.174	-152.0	-19.52	4.1			12.8	0.546
7.198	-150.0	-19.52	6.2			13.0	0.546
7.223	-153.5	-19.73	4.3			12.6	0.546
7.245	-149.3	-17.68	-7.9			48.4	0.551
7.995	-132.7	-19.28	21.5			136.2	0.564
7.978	-132.3	-17.28	5.9			104.5	0.564
7.959	-128.5	-17.13	8.5			89.2	0.564
7.934	-129.5	-17.14	7.6			87.9	0.564
7.909	-128.9	-17.11	8.0			86.6	0.564
7.885	-129.6	-17.14	7.5			86.6	0.564
7.860	-129.4	-17.12	7.6			84.8	0.564
7.835	-128.6	-16.87	6.4			84.0	0.564
7.811							0.564
7.786	-134.9	-17.5	5.1			23.9	0.564
7.761	-136.1	-18.08	8.5			26.6	0.564

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^{3}]
7.736	-141.5	-18.33	5.1			16.5	0.564
7.712	-146.1	-18.61	2.8			8.8	0.564
7.687	-147.0	-18.77	3.2			8.7	0.564
7.662	-147.6	-18.92	3.7			8.8	0.564
7.638	-149.3	-19.02	2.9			8.8	0.564
7.613	-149.8	-18.91	1.4			9.8	0.564
7.588	-150.2	-19.27	4.0			15.7	0.564
7.564	-151.4	-19.10	1.4			25.8	0.564
7.539	-151.7	-18.63	-2.7			40.6	0.564
7.514	-151.0	-19.11	1.9			45.7	0.564
7.490	-150.4	-18.98	1.4			47.4	0.564
7.465	-149.8	-18.91	1.5			58.6	0.564
7.440	-146.6	-18.82	4.0			301.0	0.564
7.416	-145.3	-18.89	5.8			300.0	0.564
7.391	-145.3	-18.94	6.2			297.0	0.564
7.366	-145.8	-18.87	5.2			304.0	0.564
7.341	-147.1	-19.06	5.4			310.0	0.564
7.317	-146.3	-19.06	6.2			309.0	0.564
7.292	-147.2	-19.09	5.5			296.0	0.564
7.267	-149.4	-19.12	3.6			288.0	0.564
8.017	-135.3	-17.78	6.9			165.0	0.558
8.041	-138.2	-17.96	5.5			330.0	0.558
8.064	-140.8	-18.21	4.9			1041.0	0.558
8.088	-143.7	-18.47	4.1			1074.0	0.558
8.112	-144.2	-18.87	6.8			682.0	0.558
8.136	-149.3	-19.21	4.4			29.2	0.558
8.159	-153.3	-19.70	4.3			17.3	0.558
8.183	-156.7	-20.06	3.8			18.1	0.558
8.207	-159.5	-20.43	3.9			23.0	0.558
8.231	-160.1	-20.59	4.6			28.7	0.558
8.254	-162.6	-20.81	3.9			36.7	0.558
8.278	-162.9	-21.10	5.9			41.1	0.558
8.302	-163.7	-21.06	4.8			49.0	0.558
8.326	-157.4	-20.31	5.1			130.4	0.558
8.349	-150.1	-19.43	5.3			527	0.558
8.373	-149.2	-18.93	2.2			496	0.558
8.397	-147.4	-18.80	3.0			54.8	0.558
8.421	-143.4	-18.46	4.3			40.1	0.558
8.444	-139.9	-17.50	0.1			65.5	0.558
8.468	-136.4	-17.65	4.8			69.7	0.558
8.498	-130.9	-17.02	5.3			271.0	0.558
8.526	-121.9	-15.75	4.1			21.7	0.588
8.549	-118.9	-15.49	5.0			11.1	0.588
8.572	-119.1	-15.27	3.1			8.7	0.588
8.595	-131.0	-16.66	2.3			9.3	0.588
8.618	-144.4	-18.36	2.5			9.2	0.588
8.641	-145.3	-18.64	3.8			8.8	0.588
8.664	-147.1	-18.87	3.9			10.7	0.588
8.685	-151.3	-19.33	3.3			11.7	0.588
8.707	-151.4	-19.57	5.2			25.0	0.540
8.731	-152.0	-19.39	3.1			10.0	0.540
8.755	-149.6	-19.41	5.7			6.1	0.540
8.778	-147.8	-19.06	4.6			5.3	0.540
8.802	-145.2	-18.87	5.8			4.9	0.540
8.826	-141.4	-18.57	7.2			4.7	0.540
8.850	-141.6	-18.42	5.8			4.8	0.540
8.874	-142.7	-18.45	4.9			5.1	0.540
8.898	-142.1	-18.51	6.0			5.1	0.540
8.922	-141.8	-18.61	7.1			4.3	0.540
8.945	-144.9	-18.56	3.6			4.8	0.540
8.969	-146.1	-18.55	2.3			7.3	0.540
8.993	-148.7	-18.97	3.1			7.6	0.540
9.017		-19.09				6.5	0.549
9.040							0.549
9.063		-20.36				4.9	0.549
9.086	-162.9	-20.70	2.7			9.8	0.549
9.109	-161.0	-20.57	3.6			11.5	0.549
9.132	-159.4					8.8	0.549
9.156	-159.3	-19.72	-1.5			10.6	0.549
9.179	-150.1	-19.05	2.3			8.8	0.549
9.202	-145.6	-18.54	2.7			6.4	0.549

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^{3}]
9.225	-142.9	-18.21	2.8			6.1	0.549
9.248	-140.3	-18.11	4.6			6.1	0.549
9.271	-137.9					6.1	0.549
9.295	-137.1	-17.42	2.3			6.0	0.549
9.318	-134.1	-17.07	2.5			6.1	0.549
9.341	-130.9	-17.04	5.4			6.1	0.549
9.364	-130.4	-16.87	4.6			6.1	0.549
9.387	-130.0	-16.94	5.5			6.3	0.549
9.410	-129.6	-16.93	5.8			6.2	0.549
9.433	-130.9	-16.87	4.1			6.3	0.549
9.460	-133.0	-16.74	0.9			7.6	0.549
9.487	-131.8	-17.10	5.0			5.9	0.590
9.510	-134.4	-17.12	2.6			7.3	0.590
9.533	-135.1	-17.35	3.7			16.2	0.590
9.557	-144.2	-18.26	1.9			42.4	0.590
9.580	-151.2	-19.27	3.0			63.6	0.590
9.603	-146.4	-18.70	3.2			92.4	0.590
9.627	-145.1	-18.69	4.4			101.3	0.590
9.650	-143.5	-18.47	4.3			118.8	0.590
9.673	-142.9	-18.40	4.3			91.7	0.590
9.700	-143.7	-18.46	4.0			86.3	0.590
9.727	-153.4	-19.44	2.1			39.8	0.520
9.751	-156.7	-19.78	1.5			6.1	0.520
9.774	-161.6	-20.57	3.0			29.3	0.520
9.798	-154.6	-19.50	1.4			40.7	0.520
9.822	-151.2	-18.93	0.2			26.6	0.520
9.846	-147.3	-18.84	3.4			12.6	0.520
9.869	-146.7	-18.76	3.4			13.1	0.520
9.893	-146.7	-18.67	2.7			10.9	0.520
9.915	-145.9	-18.70	3.7			9.0	0.520
9.937	-147.5	-18.98	4.3			6.6	0.552
9.960	-149.6	-19.04	2.7			10.4	0.552
9.984	-151.6	-19.08	1.0			11.3	0.552
10.007	-152.0	-19.52	4.2			12.6	0.552
10.031	-153.6	-19.72	4.2			11.7	0.552
10.055	-155.4	-19.81	3.1			10.4	0.552
10.078	-156.9	-20.05	3.5			10.4	0.552
10.108	-161.0	-20.93	6.4			6.1	0.552

Year	Layer thickness [m]	mean ^{18}O [‰]	mean ^{2}H [‰]	mean ^{3}H [TU]	annual accumulation [mm w.e.]
1986	0.790	-19.80	-156.5		354
1985	0.548	-22.68	-178.1		230
1984	0.739	-16.47	-129.1		344
1983	0.383	-17.32	-135.3		171
1982	0.905	-19.66	-153.6		432
1981	0.662	-17.93	-140.1		323
1980	1.007	-19.49	-152.9		487
1979	0.815	-17.08	-132.0		421
1978	0.714	-17.00	-132.7		386
1977	0.675	-18.47	-144.8		371
1976	0.625	-18.61	-144.8		352
1975	0.650	-18.69	-144.1		364
1974	0.356	-18.30	-141.9		200
1973	0.510	-18.54	-144.3		279
1972	0.548	-18.45	-144.5		305



Shallow firn core, E002, Ekström-Traverse, km 02, 1986/87

Ekström Traverse, km40

70°58'S 8°22'W
1986/87
9.66m
E040

Mean Depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. (μS/cm)	Density [g/cm³]
0.010	-206.9	-26.18	2.5			5.0	0.432
0.030	-217.9	-27.28	0.4			4.5	0.432
0.060	-213.3	-27.63	7.7			4.2	0.432
0.080	-202.8	-26.48	9.0			6.4	0.432
0.100	-190.7	-24.95	8.9			7.6	0.432
0.120	-185.6	-24.13	7.4			6.8	0.432
0.150	-183.9	-23.59	4.8			6.7	0.432
0.170	-182.6	-23.32	3.9			6.8	0.432
0.190	-178.6	-23.16	6.7			6.5	0.432
0.220	-179.5	-23.13	5.5			6.2	0.432
0.240	-179.9	-23.04	4.4			6.3	0.432
0.260	-179.7	-22.87	3.3			6.2	0.432
0.280	-179.9	-23.18	5.5			6.7	0.432
0.310	-179.8	-23.21	5.9			6.7	0.432
0.330	-180.1	-23.28	6.1			7.0	0.432
0.350	-181.9	-23.35	4.9			10.7	0.432
0.370	-178.6	-23.18	6.8			8.0	0.432
0.400							0.432
0.430	-163.5	-21.50	8.5			9.8	0.421
0.460	-156.5	-20.78	9.7			13.4	0.421
0.480	-151.7	-20.70	13.9			13.6	0.421
0.500	-154.5	-21.15	14.7			13.6	0.421
0.530	-163.3	-21.68	10.1			4.5	0.421
0.550	-167.4	-22.37	11.6			3.7	0.421
0.570	-167.5	-22.53	12.7			4.1	0.421
0.600	-163.8	-21.83	10.8			3.9	0.421
0.620	-158.5	-21.31	12.0			4.2	0.421
0.640	-155.8	-20.45	7.8			4.3	0.421
0.670	-151.7	-19.92	7.7			3.8	0.421
0.690	-148.9	-19.68	8.5			5.1	0.421
0.720	-149.5	-19.65	7.7			5.6	0.421
0.740	-158.7	-20.48	5.1			7.1	0.421
0.760	-175.7	-22.41	3.6			4.4	0.421
0.800	-199.1	-25.96	8.6			4.0	0.359
0.830	-205.5	-26.36	5.4			3.4	0.359
0.850	-206.9	-27.16	10.4			3.1	0.359
0.870	-210.1	-27.51	10.0			3.0	0.359
0.900	-211.0	-27.74	10.9			3.1	0.359
0.920	-216.5	-28.25	9.5			3.0	0.359
0.950	-221.6	-28.68	7.8			3.2	0.359
0.980	-225.7	-28.82	4.9			3.2	0.446
1.000	-229.3	-29.91	10.0			2.9	0.446
1.030	-227.4	-29.69	10.1			4.7	0.446
1.050	-220.4	-28.84	10.3			6.6	0.446
1.070	-210.9	-27.97	12.8			5.3	0.446
1.100	-203.7	-27.14	13.4			5.0	0.446
1.130	-205.7	-27.39	13.4			3.7	0.446
1.160	-210.8	-27.84	11.9			3.5	0.446
1.180	-215.0	-28.21	10.7			3.7	0.446
1.200	-216.5	-28.14	8.6			3.9	0.446
1.230	-211.8	-27.55	8.6			4.0	0.446
1.250	-201.0	-26.24	8.9			3.7	0.446
1.270	-186.4	-24.31	8.1			4.2	0.446
1.300	-166.2	-21.84	8.5			9.3	0.446
1.320	-157.0	-20.40	6.2			5.6	0.446
1.350	-157.4	-20.50	6.6			4.0	0.446
1.390	-180.5	-22.83	2.1			3.8	0.445
1.420	-190.9	-24.33	3.7			3.6	0.445
1.450	-197.3	-24.61	-0.4			3.7	0.445
1.470	-197.9	-25.72	7.9			4.5	0.445

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	σ(^{3}H) [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
1.490	-202.8	-26.61	10.1			4.6	0.445
1.520	-211.8	-27.47	8.0			5.1	0.445
1.540	-222.7	-29.01	9.4			4.7	0.445
1.570	-224.9	-28.28	1.3			4.6	0.445
1.590	-222.9	-28.95	8.7			5.5	0.445
1.620	-222.2	-28.92	9.2			3.1	0.445
1.640	-222.2	-28.84	8.5			3.6	0.445
1.660							0.445
1.690	-221.1	-28.12	3.9			3.9	0.445
1.710	-221.1	-28.89	10.0			2.8	0.445
1.740	-215.3	-28.61	13.6			4.0	0.445
1.770	-204.3	-27.01	11.8			8.4	0.416
1.790	-197.7	-25.78	8.5			7.1	0.416
1.810	-192.4	-25.00	7.6			3.7	0.416
1.830	-186.0	-24.34	8.7			3.2	0.416
1.860	-182.1	-24.08	10.5			4.1	0.416
1.880	-185.2	-24.38	9.8			5.8	0.443
1.900	-194.9	-25.21	6.8			5.6	0.443
1.930	-204.8	-26.59	7.9			5.6	0.443
1.950	-216.6	-27.98	7.2			5.6	0.443
1.970	-230.1	-29.26	4.0			5.3	0.443
1.990	-236.1	-30.10	4.7			6.1	0.443
2.010	-243.4	-30.28	-1.2			6.5	0.443
2.040	-235.9	-30.59	8.8			4.9	0.443
2.060	-238.8	-30.52	5.4			4.5	0.443
2.080	-251.1	-30.14	-10.0			4.1	0.443
2.100	-231.4	-29.54	4.9			3.6	0.443
2.130							0.443
2.150	-216.9	-27.58	3.7			3.3	0.443
2.170	-207.1	-26.44	4.4			2.9	0.443
2.190	-195.1	-25.18	6.3			3.8	0.443
2.220	-185.9	-23.92	5.5			4.0	0.443
2.240	-176.7	-23.04	7.6			4.2	0.443
2.260	-170.2	-22.17	7.2			5.1	0.443
2.280	-164.3	-21.35	6.5			9.9	0.443
2.300	-157.7	-20.88	9.3			6.8	0.443
2.330	-158.0	-20.61	6.9			3.3	0.443
2.350	-156.8	-20.49	7.1			3.7	0.443
2.380	-159.6	-20.86	7.3			7.8	0.443
2.400	-162.1	-21.03	6.1			4.5	0.430
2.420	-169.0	-21.79	5.3			3.9	0.430
2.440	-176.2	-22.65	5.0			3.9	0.430
2.460	-185.4	-23.83	5.2			2.8	0.539
2.480	-193.9	-24.51	2.2			5.6	0.539
2.500	-195.4	-25.18	6.0			4.2	0.539
2.520	-195.0	-25.20	6.6			4.8	0.539
2.540	-203.1	-26.08	5.5			4.5	0.539
2.560	-203.6	-26.26	6.5			4.1	0.539
2.580	-199.6	-25.67	5.8			3.6	0.539
2.610	-202.9	-26.05	5.5			4.4	0.637
2.630	-201.2	-25.68	4.2			2.9	0.637
2.650	-201.7	-25.89	5.4			3.8	0.637
2.670	-200.3	-25.21	1.4			4.0	0.637
2.690	-202.1	-26.03	6.1			3.9	0.637
2.710	-200.1	-25.76	6.0			4.6	0.637
2.730	-204.0	-25.43	-0.6			6.0	0.637
2.750	-205.6	-25.87	1.4			6.0	0.637
2.770	-207.4	-25.93	0.0			5.8	0.637
2.790	-213.8	-27.70	7.8			4.8	0.637
2.810	-208.6	-26.40	2.6			7.2	0.637
2.840	-190.8	-24.71	6.9			9.9	0.427
2.860	-190.0	-24.02	2.2			5.5	0.427
2.890	-187.5	-24.25	6.5			5.2	0.427
2.910	-186.5	-23.61	2.4			4.4	0.427
2.930	-182.0	-23.27	4.2			4.1	0.427
2.960	-180.5	-22.66	0.8			5.1	0.427
2.980	-173.2	-22.29	5.1			5.3	0.427
3.010	-171.0	-21.84	3.7			5.8	0.427
3.030	-165.5	-21.57	7.1			4.4	0.427
3.050	-161.0	-20.68	4.4			6.0	0.427
3.080	-181.6	-23.02	2.6			5.6	0.427

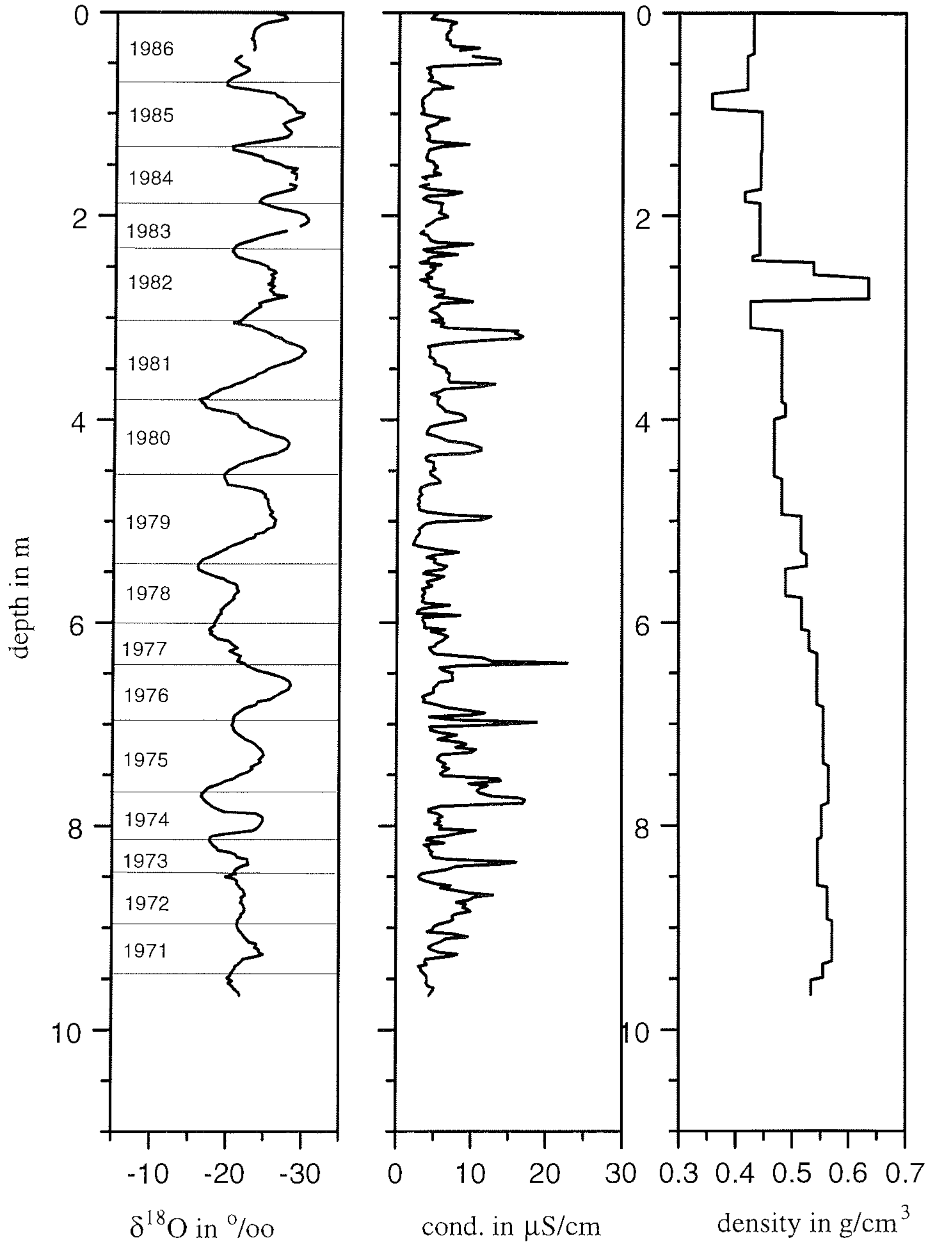
Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
3.100	-184.0	-23.35	2.8			6.6	0.427
3.130	-193.1	-24.71	4.6			16.1	0.482
3.150	-196.3	-25.41	7.0			15.7	0.482
3.180	-201.8	-26.09	6.9			16.8	0.482
3.200	-207.1	-27.03	9.1			16.4	0.482
3.230	-213.6	-27.39	5.5			10.0	0.482
3.250	-219.5	-28.34	7.2			6.3	0.482
3.280	-226.7	-29.50	9.3			3.9	0.482
3.300	-230.6	-29.87	8.4			4.1	0.482
3.330	-233.7	-30.25	8.3			4.2	0.482
3.350	-231.2	-29.92	8.2			4.2	0.482
3.380	-228.8	-29.59	7.9			4.1	0.482
3.400	-221.2	-29.06	11.3			4.6	0.482
3.430	-216.6	-28.23	9.2			4.9	0.482
3.450	-207.4	-27.17	10.0			4.7	0.482
3.480	-198.5	-26.04	9.8			5.8	0.482
3.500	-188.4	-25.26	13.7			6.3	0.482
3.530	-185.5	-24.70	12.1			6.4	0.482
3.550	-179.0	-23.90	12.2			6.8	0.482
3.580	-176.1	-23.42	11.3			6.7	0.482
3.600	-171.1	-22.63	9.9			6.6	0.482
3.630	-165.6	-21.95	10.0			6.8	0.482
3.650	-156.1	-20.99	11.8			13.0	0.482
3.680	-149.7	-20.14	11.4			10.6	0.482
3.700	-143.2	-19.06	9.3			6.2	0.482
3.730	-136.8	-18.27	9.4			5.3	0.482
3.750	-131.3	-17.67	10.1			4.4	0.482
3.780	-128.4	-17.28	9.8			5.5	0.482
3.800	-125.8	-16.20	3.9			5.3	0.482
3.830	-126.1	-16.49	5.8			5.2	0.482
3.850	-130.0	-16.82	4.6			5.2	0.489
3.880	-131.6	-17.06	4.9			5.8	0.489
3.900	-139.3	-17.84	3.4			6.1	0.489
3.920	-149.9	-19.36	5.0			6.3	0.489
3.950	-163.8	-21.17	5.6			8.5	0.489
3.970	-165.1	-21.41	6.2			8.9	0.489
4.000	-164.5	-21.79	9.8			9.1	0.469
4.020	-168.5	-21.99	7.4			7.8	0.469
4.040	-169.1	-22.56	11.4			5.9	0.469
4.070	-174.1	-22.86	8.8			4.3	0.469
4.090	-181.1	-23.67	8.3			4.1	0.469
4.110	-188.6	-24.54	7.7			3.9	0.469
4.140	-194.9	-25.43	8.5			3.8	0.469
4.160	-204.1	-26.36	6.8			4.9	0.469
4.180	-211.4	-27.36	7.5			5.7	0.469
4.210	-213.7	-27.94	9.8			6.6	0.469
4.230	-214.5	-28.13	10.5			9.1	0.469
4.250	-219.6	-28.08	5.1			10.0	0.469
4.280	-214.6	-27.84	8.1			11.2	0.469
4.300	-206.1	-27.33	12.5			11.2	0.469
4.330	-196.9	-26.45	14.7			9.6	0.469
4.350	-195.9	-25.59	8.8			4.3	0.469
4.370	-185.5	-24.33	9.1			3.7	0.469
4.400	-175.6	-23.30	10.8			3.8	0.469
4.420	-168.2	-22.34	10.5			4.7	0.469
4.440	-162.6	-21.49	9.3			4.8	0.469
4.470	-155.5	-20.85	11.3			4.7	0.469
4.490	-151.2	-20.28	11.0			5.0	0.469
4.510	-149.1	-19.96	10.6			4.3	0.469
4.540	-143.0	-19.55	13.4			4.4	0.469
4.560	-141.2	-19.51	14.9			4.8	0.469
4.590	-142.4	-19.67	15.0			5.4	0.483
4.620	-146.1	-19.89	13.0			5.7	0.483
4.640	-147.8	-20.02	12.4			4.1	0.483
4.670	-168.4	-22.64	12.7			3.1	0.483
4.690	-177.2	-23.67	12.1			3.0	0.483
4.710	-183.9	-24.56	12.6			3.0	0.483
4.740	-195.2	-25.06	5.3			3.2	0.483
4.760	-195.5	-24.94	4.1			2.9	0.483
4.790	-198.2	-25.41	5.1			2.8	0.483
4.810	-198.7	-25.38	4.3			3.0	0.483

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^3]
4.840	-194.5	-25.39	8.7			2.7	0.483
4.860	-197.9	-25.54	6.4			2.9	0.483
4.890	-198.4	-25.69	7.1			2.9	0.483
4.910	-200.7	-26.03	7.5			3.9	0.483
4.940	-203.6	-25.65	1.6			7.0	0.483
4.960	-201.9	-26.02	6.2			12.6	0.517
4.990	-204.7	-26.46	7.0			11.1	0.517
5.010	-207.6	-26.31	2.9			5.0	0.517
5.030	-206.3	-26.33	4.3			3.7	0.517
5.060	-202.6	-26.11	6.2			3.2	0.517
5.080	-197.3	-25.31	5.2			2.9	0.517
5.110	-192.4	-24.87	6.6			3.0	0.517
5.130	-186.6	-23.74	3.3			2.9	0.517
5.160	-180.1	-23.63	8.9			2.5	0.517
5.180	-174.5	-22.65	6.7			2.4	0.517
5.210	-166.3	-21.93	9.2			2.2	0.517
5.230	-161.2	-21.05	7.2			2.1	0.517
5.250	-154.7	-20.34	8.1			3.0	0.517
5.280	-147.5	-19.64	9.7			5.3	0.517
5.310	-140.9	-18.88	10.1			8.2	0.517
5.340	-136.3	-18.14	8.9			4.8	0.527
5.360	-129.9	-17.48	9.9			3.9	0.527
5.380	-124.5	-16.77	9.7			5.1	0.527
5.410	-120.8	-16.35	10.1			4.9	0.527
5.430	-119.9	-16.14	9.3			5.5	0.527
5.450	-118.9	-16.10	9.9			6.6	0.527
5.480	-121.1	-16.17	8.3			6.0	0.490
5.500	-125.0	-16.68	8.4			3.8	0.490
5.520	-131.9	-17.46	7.8			3.5	0.490
5.550	-140.2	-18.42	7.2			6.2	0.490
5.570	-149.4	-19.46	6.2			5.5	0.490
5.600	-157.5	-20.16	3.8			3.9	0.490
5.620	-161.2	-21.05	7.2			4.1	0.490
5.640	-164.4	-21.32	6.1			4.6	0.490
5.670	-166.1	-21.35	4.8			3.3	0.490
5.690	-165.2	-21.51	6.9			3.6	0.490
5.710	-164.0	-21.28	6.2			3.7	0.490
5.740	-160.4	-20.85	6.4			3.3	0.490
5.760	-159.9	-20.95	7.7			3.5	0.517
5.790	-156.8	-20.42	6.6			3.3	0.517
5.810	-154.3	-20.18	7.2			3.8	0.517
5.830	-151.1	-19.82	7.5			7.0	0.517
5.860	-147.5	-19.43	7.9			3.5	0.517
5.880	-145.0	-19.11	7.9			2.8	0.517
5.910	-143.5	-19.20	10.1			2.6	0.517
5.930	-141.6	-18.86	9.3			8.4	0.517
5.950	-139.2	-18.75	10.8			3.4	0.517
5.980	-138.4	-18.55	10.0			3.4	0.517
6.000	-137.8	-18.33	8.9			3.6	0.517
6.030	-137.0	-18.28	9.2			3.7	0.517
6.050	-138.4	-17.90	4.9			3.6	0.517
6.070	-136.4	-17.62	4.6			6.4	0.517
6.090	-137.7	-18.00	6.3			4.5	0.531
6.110	-136.6	-17.79	5.7			5.8	0.531
6.140	-141.5	-18.44	6.0			6.8	0.531
6.160	-147.1	-18.69	2.5			6.4	0.531
6.180	-155.3	-20.19	6.3			6.0	0.531
6.210	-161.6	-20.64	3.5			5.2	0.531
6.230	-163.2	-21.03	5.0			5.1	0.531
6.250	-165.4	-21.43	6.0			4.3	0.531
6.280	-166.6	-20.34	-3.9			4.5	0.531
6.310	-167.2	-21.21	2.5			5.0	0.545
6.330	-164.9	-21.82	9.6			8.1	0.545
6.350	-163.2	-21.66	10.1			11.6	0.545
6.380	-160.5	-21.41	10.8			12.6	0.545
6.400	-168.2	-22.31	10.3			22.9	0.545
6.430	-172.4	-22.70	9.2			8.1	0.545
6.450	-178.2	-23.42	9.2			5.7	0.545
6.470	-186.3	-24.02	5.9			6.1	0.545
6.500	-194.7	-25.56	9.8			7.4	0.545
6.520	-203.8	-26.48	8.1			7.3	0.545

Mean depth [m]	^{2}H [‰]	^{18}O [‰]	d [‰]	^{3}H [TU]	$\sigma(^{3}H)$ [TU]	El. Cond. [μS/cm]	Density [g/cm^{3}]
6.540	-209.9	-27.35	8.9			7.4	0.545
6.570	-213.4	-28.06	11.1			7.4	0.545
6.590	-218.7	-28.42	8.7			5.6	0.545
6.620	-222.4	-28.49	5.5			5.3	0.545
6.640	-218.8	-28.28	7.4			4.9	0.545
6.660	-216.4	-28.20	9.2			4.9	0.545
6.690	-212.4	-27.32	6.1			4.9	0.545
6.710	-208.2	-26.87	6.8			4.0	0.545
6.730	-202.9	-26.37	8.1			3.4	0.545
6.760	-196.1	-25.79	10.3			3.7	0.545
6.780	-189.1	-24.17	4.3			3.5	0.545
6.810	-180.8	-23.84	9.9			5.4	0.545
6.840	-169.1	-22.60	11.8			6.6	0.556
6.860	-164.7	-22.07	11.9			8.9	0.556
6.890	-160.4	-21.57	12.2			11.8	0.556
6.910	-158.1	-21.10	10.7			9.9	0.556
6.930	-155.9	-20.99	12.1			4.4	0.556
6.960	-156.1	-20.87	10.9			7.7	0.556
6.980	-154.7	-20.89	12.5			18.8	0.556
7.010	-156.2	-20.70	9.4			12.8	0.556
7.030	-157.2	-20.87	9.8			4.4	0.556
7.060	-156.3	-20.97	11.5			4.5	0.556
7.080	-161.0	-21.26	9.1			5.5	0.556
7.110	-165.7	-21.73	8.2			8.0	0.556
7.130	-169.6	-22.17	7.8			6.6	0.556
7.150	-173.6	-22.53	6.6			5.5	0.556
7.180	-178.6	-23.41	8.7			8.4	0.556
7.200	-181.1	-23.84	9.6			9.3	0.556
7.230	-183.0	-24.27	11.2			7.9	0.556
7.250	-185.2	-24.61	11.7			10.6	0.556
7.280	-185.6	-24.84	13.2			10.0	0.556
7.300	-184.8	-24.93	14.7			6.0	0.556
7.320	-183.8	-24.76	14.3			5.6	0.556
7.350	-184.0	-24.32	10.6			5.4	0.556
7.370	-182.3	-24.54	14.0			5.9	0.556
7.390	-180.6	-24.13	12.4			6.5	0.556
7.420	-176.2	-23.28	10.1			6.1	0.565
7.440	-174.6	-23.48	13.2			7.0	0.565
7.470	-171.2	-22.93	12.2			6.2	0.565
7.490	-166.9	-22.09	9.9			5.8	0.565
7.510	-162.4	-21.49	9.5			6.2	0.565
7.540	-156.0	-20.89	11.2			13.8	0.565
7.560	-149.0	-19.86	9.9			14.0	0.565
7.590	-142.2	-19.06	10.3			9.7	0.565
7.610	-134.7	-18.25	11.3			12.2	0.565
7.630	-129.3	-17.53	11.0			11.2	0.565
7.660	-127.7	-17.18	9.7			10.8	0.565
7.680	-125.3	-16.83	9.4			11.2	0.565
7.710	-124.2	-16.71	9.5			12.7	0.565
7.730	-125.6	-16.87	9.4			16.6	0.565
7.750	-128.4	-17.08	8.2			17.3	0.565
7.780	-133.3	-17.57	7.3			17.0	0.565
7.810	-136.5	-18.09	8.2			5.8	0.553
7.840	-144.9	-19.06	7.6			4.3	0.553
7.860	-149.9	-19.66	7.4			4.3	0.553
7.880	-182.2	-23.95	9.4			5.4	0.553
7.910	-188.0	-24.73	9.8			6.1	0.553
7.930	-189.3	-24.85	9.5			5.5	0.553
7.960	-188.2	-24.80	10.2			5.8	0.553
7.980	-188.4	-24.57	8.2			5.1	0.553
8.000	-184.0	-24.44	11.5			6.0	0.553
8.030	-181.7	-23.90	9.5			5.7	0.553
8.050	-176.8	-23.44	10.7			10.6	0.553
8.080	-148.2	-19.77	10.0			7.9	0.553
8.100	-135.5	-18.12	9.5			6.5	0.553
8.120	-132.0	-17.83	10.6			4.2	0.553
8.140	-132.0	-17.73	9.8			4.0	0.546
8.170	-134.5	-18.05	9.9			6.4	0.546
8.190	-136.5	-18.20	9.1			3.7	0.546
8.210	-139.3	-18.60	9.5			4.3	0.546
8.240	-142.9	-18.91	8.4			4.4	0.546

Mean depth [m]	^2H [‰]	^{18}O [‰]	d [‰]	^3H [TU]	$\sigma(^3H)$ [TU]	El. Cond. [µS/cm]	Density [g/cm^3]
8.260	-157.5	-20.40	5.7			4.8	0.546
8.280	-161.4	-21.13	7.6			4.5	0.546
8.310	-167.4	-21.48	4.4			4.9	0.546
8.330	-175.0	-22.80	7.4			6.7	0.546
8.360	-175.5	-22.83	7.1			16.1	0.546
8.380	-175.5	-22.92	7.9			13.9	0.546
8.400	-164.3	-21.96	11.4			8.0	0.546
8.430	-164.5	-21.27	5.7			6.8	0.546
8.450	-163.3	-21.06	5.2			5.2	0.546
8.470	-164.1	-21.34	6.6			3.4	0.546
8.500	-161.5	-19.90	-2.3			3.0	0.546
8.520	-161.4	-21.06	7.1			3.1	0.546
8.540	-165.0	-21.42	6.3			3.8	0.546
8.570	-163.4	-21.37	7.6			5.2	0.546
8.590	-165.4	-21.65	7.8			7.2	0.546
8.610	-169.1	-21.83	5.5			5.9	0.562
8.630	-172.1	-22.25	5.9			7.5	0.562
8.660	-171.8	-22.39	7.3			9.7	0.562
8.680	-172.6	-22.51	7.5			13.0	0.562
8.700	-172.0	-22.01	4.1			10.4	0.562
8.730	-171.4	-22.10	5.4			9.7	0.562
8.750	-170.8	-21.89	4.3			8.0	0.562
8.770	-173.1	-22.20	4.5			9.3	0.562
8.800	-171.8	-22.38	7.2			8.9	0.562
8.820	-172.8	-22.42	6.6			9.6	0.562
8.840	-172.4	-22.39	6.7			9.9	0.562
8.870	-165.0	-21.93	10.4			7.8	0.562
8.890	-164.5	-21.97	11.3			7.4	0.562
8.920	-162.0	-21.57	10.5			7.6	0.562
8.940	-161.9	-21.52	10.3			7.1	0.571
8.970	-160.3	-21.47	11.5			5.5	0.571
8.990	-154.4	-21.48	17.4			5.0	0.571
9.020	-164.9	-21.64	8.2			4.8	0.571
9.040	-166.5	-21.91	8.8			4.1	0.571
9.060	-171.7	-22.13	5.3			7.5	0.571
9.090	-172.8	-22.40	6.4			9.6	0.571
9.110	-178.9	-22.69	2.6			6.6	0.571
9.140	-180.7	-23.04	3.6			5.9	0.571
9.160	-185.6	-24.07	7.0			5.1	0.571
9.190	-189.8	-23.80	0.6			4.3	0.571
9.210	-192.1	-24.29	2.2			4.5	0.571
9.240	-189.1	-24.43	6.3			5.7	0.571
9.260	-194.3	-24.92	5.1			8.2	0.571
9.280	-187.6	-24.12	5.4			7.3	0.571
9.310	-170.7	-22.25	7.3			3.9	0.571
9.330	-169.1	-22.02	7.1			3.8	0.571
9.360	-164.9	-21.54	7.4			4.1	0.555
9.380	-161.2	-21.16	8.1			3.0	0.555
9.400	-161.5	-21.15	7.7			3.3	0.555
9.420	-155.9	-20.96	11.8			3.3	0.555
9.450	-153.3	-20.66	12.0			3.7	0.555
9.470	-149.4	-20.55	15.0			4.0	0.555
9.490	-147.2	-20.18	14.2			4.1	0.555
9.520	-154.9	-20.80	11.5			4.1	0.533
9.540	-157.3	-20.33	5.3			4.0	0.533
9.570	-159.8	-20.85	7.0			4.2	0.533
9.590	-161.5	-20.98	6.3			5.0	0.533
9.610	-163.6	-21.29	6.7			4.9	0.533
9.640	-163.0	-21.75	11.0			4.6	0.533
9.660	-165.4	-21.82	9.2			4.4	0.533

Year	Layer thickness	mean ^{18}O	mean ^{2}H	mean ^{3}H	annual accumulation
	[m]	[‰]	[‰]	[TU]	[mm w.e.]
1986	0.592	-22.29		-170.2	253
1985	0.649	-26.13		-200.1	271
1984	0.499	-26.47		-204.5	220
1983	0.487	-26.24		-204.4	215
1982	0.696	-24.51		-191.5	363
1981	0.766	-24.63		-188.3	364
1980	0.766	-22.60		-172.3	363
1979	0.870	-22.76		-174.0	437
1978	0.591	-19.30		-146.7	298
1977	0.395	-20.03		-154.6	210
1976	0.556	-24.92		-190.3	305
1975	0.743	-21.75		-163.3	416
1974	0.441	-20.83		-157.5	245
1973	0.336	-29.78		-158.9	184
1972	0.464	-21.86		-168.0	259
1971	0.522	-22.45		-172.1	296



Shallow firn core, E040, Ekström-Traverse, km40, 1986/87

APPENDIX D

List of wintering meteorologists

1981/82	Friedl Obleitner
1982/83	Gert König / Josef Kipfstuhl
1983/84	Hans-Jürgen Belitz / Hans-Ulrich Stuckenberg
1984/85	Reinhard Beyer / Joachim Schug
1985/86	Peter Wachs / Bernd Wortmann
1986/87	Karl Bumke / Andreas Löbe
1987/88	Andreas Löbe / Klaus Sturm
1988/89	Heinrich Strunk / Guido Wolz
1989/90	Rudolf Mair / Karl-Heinz Pfaff
1990/91	Elisabeth Schlosser / Ulrike Wyputta
1991/92	Paul Rainer / Stephan Weber
1992/93	Christoph Kleefeld / Harald Rentsch
1993/94	Jörg Hofmann / Uwe Terzenbach
1994/95	Jens Fickert / Valeri Goldberg
1995/96	Stephan Hofinger / Torsten Schmidt
1996/97	Martin Arck /Anke Schmidt

Thanks are due to all other wintering colleagues, who helped the meteorologists with the glaciological field work.

APPENDIX E

List of involved expedition members and institutes

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