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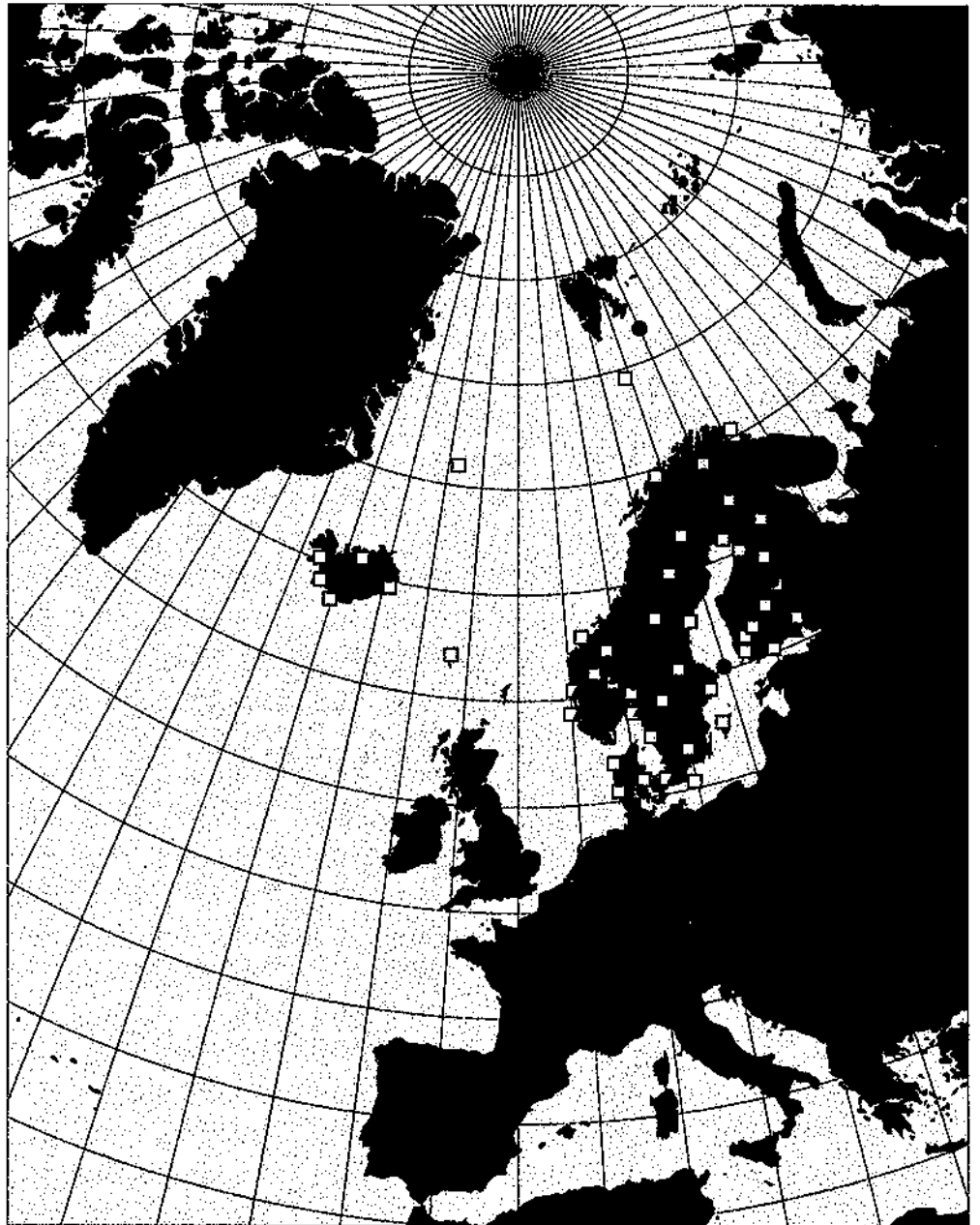
REWARD: - Relating Extreme Weather to Atmospheric  
circulation using a Regionalised Dataset.

# Description of REWARD data set, Version 1.0

REPORT NR: 16/98

Achim Drebs, Hans Alexandersson, Povl Frich,  
Eirik J. Førland, Trausti Jónsson, Heikki Tuomenvirta

KLIMA



# DNMI-REPORT

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## Description of REWARD dataset, Version 1

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PROJECT CONTRACTORS:

Nordic Council of Ministers (Contract FS/HFj/X-93001)

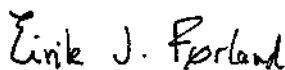
National Meteorological Institutes in Denmark<sup>3</sup>, Finland<sup>1</sup>, Iceland<sup>5</sup>, Norway<sup>4</sup> and  
Sweden<sup>2</sup>

SUMMARY:

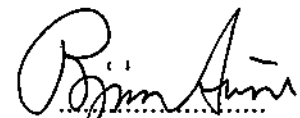
Within the framework of the REWARD-project, the Nordic meteorological institutes produced a comprehensive data set of climatic extremes containing stations from Fenno-Scandia, Nordic Seas and Greenland. Long-term monthly time series of extreme temperatures (daily mean maximum, daily mean minimum, absolute highest and absolute lowest), diurnal temperature range and maximum 1-day precipitation were analysed for trends. The work was accomplished under the REWARD (Relating Extreme Weather to Atmospheric circulation using a Regionalised Dataset) project in 1996-1997.

This report contains information about the data used in the project. Due to different data status in the Nordic countries, the number of stations contributing data to the dataset varies from country to country and from element to element. The REWARD dataset contains data from 67 stations for the temperature elements and from 84 stations for the precipitation element. The time period covered is 1873 - 1995.

SIGNATURES:



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## Foreword

The lack of data and need for analyses of climatic extremes were recognised by Nordic climatologists, and as a continuation of the EC/NMR-project «North Atlantic Climatological dataset, NACD» (Dahlström et al., 1995; Frich et al., 1996) the Nordic meteorological institutes suggested a major effort to establish and analyse a comprehensive dataset of climatic extremes (Førland et al., 1996). The original plans for the suggested Nordic project were not fully approved, but a revised project was during 1996-1997 partly financed by the Nordic Council of Ministers (NMR, Contract FS/HFj/X-93001) and partly by own funding by the national meteorological institutes. The project was named *REWARD - Relating Extreme Weather to Atmospheric circulation using a Regionalised Dataset*.

The main objectives of the REWARD-project were:

- *Establish a Nordic dataset of climatic extremes*
- *Analyse trends in extreme temperatures (maximum and minimum temperature, diurnal temperature range)*
- *Analyse trends in maximum 1-day precipitation*
- *Study relations between atmospheric circulation and extreme climatic events*
- *Evaluate appropriate extreme value distributions for Nordic series of climatic extremes*
- *Work out a first edition of a Nordic Atlas of climatic extremes*

The following scientists have contributed to the REWARD-project (national project leaders are underlined):

The Danish Meteorological Institute (DMI): Povl Frich, Torben Schmith

The Finnish Meteorological Institute (FMI): Achim Drebs, Raino Heino, Jaakko Helminen, Heikki Tuomenvirta,

The Iceland Meteorological Office (VI): Trausti Jónsson, Þórunn Pálsdóttir, Þórður Arason

The Norwegian Meteorological Institute (DNMI): Eirik J. Førland, Inger Hanssen-Bauer, Per Øyvind Nordli, Ole Einar Tveito

The Swedish Meteorological and Hydrological Institute (SMHI) : Hans Alexandersson, Bengt Dahlström, Carla Karlström, Haldo Vedin

The REWARD-project was co-ordinated by Eirik J. Førland, DNMI

## 1. Introduction

The lack of data and need for analyses of climatic extremes pointed out by Nicholls et al. (1996), were recognised also by Nordic climatologists. In the joint Nordic project **REWARD** (*Relating Extreme Weather to Atmospheric circulation using a Regionalised Dataset*, Førland et al., 1998a), the main objectives were to establish and analyse a Nordic dataset of climatic extremes.

In the REWARD-project, a special focus is put upon whether the observed global warming has caused any changes of extreme climatic events in the Nordic area. Trends in the REWARD series of daily minimum and maximum temperatures are analysed by Tuomenvirta et al. (1998), and studies of maximum 1-day precipitation in the Nordic countries are presented by Førland et al. (1998b). A survey of climatological extremes in the Nordic region is given by Tveito et al. (1998).

This report gives a presentation of the REWARD-dataset. The climatic elements in the dataset are monthly values of:

- Maximum 1-day precipitation
- Mean maximum and minimum temperatures
- Absolute daily maximum and minimum temperatures (incl. dates)

The longest time series included in the dataset are 123 years. More than half of the series start before 1900. Not every country produced all elements and some countries had only shorter series available, e.g. Icelandic temperature series do not start before 1949. Figures 1-3 describe the number of stations in the dataset by country, element, and year.

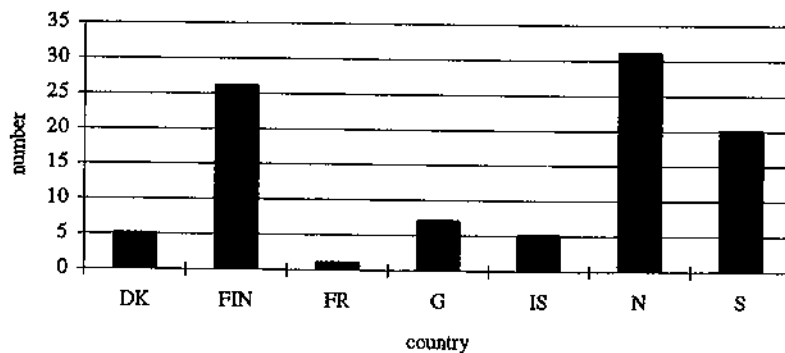


Fig. 1. Number of stations by country

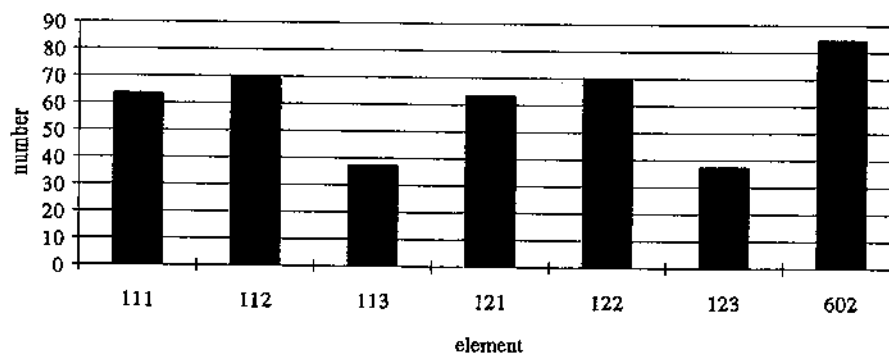


Fig. 2. Number of stations by element (codes are given in section 4)

Digitisation and quality control methods are discussed in section 2, metadata and homogeneity in section 3, station catalogue, data dictionary and data exchange standard in section 4, and the survey of temperature and precipitation series in section 5.

*Copies of the REWARD Dataset, Version 1.0 can be ordered by contacting one of the national data advisers listed in appendix 4.*

## **2. Digitisation and quality control methods**

In the Nordic countries, just a few climatological time series of daily data are available in digital form before ca. 1955. However, paper copies of monthly summaries of temperature and precipitation extremes are available. For selected stations, these summaries have been digitised, partly within the framework of REWARD and partly during the NACD-project (Frich et al., 1996).

As indicated in earlier reports (Frich et al., 1994, 1996), digitising, homogeneity testing and climatological analysis are closely interrelated. The detailed statistical analysis can frequently reveal inhomogeneities that previously were unknown.

In the spirit of the NACD each country used their own quality tests, double keying of monthly data, comparison of digitised annual means/sums with means/sums of digitised monthly values and/or means/sums of digitised daily values, various tests for outliers and comparisons with extreme value distributions, internal logical tests, e.g.  $T_h > T_x > T > T_n > T_l$ . Some quality control took place also during the research of the whole dataset.

## **3. Metadata and homogeneity**

The stations used in the REWARD dataset were almost the same for the temperature elements as used in the NACD dataset. Therefore the station histories were known quite well. For the precipitation studies several new stations were included. A well founded description of metadata/station history archives and homogeneity is published in Frich et al. (1996). The homogeneity status of the REWARD series are indicated by a «status code» in Appendix 2.

#### 4. Station catalogue, data dictionary and data exchange standard

The station catalogue contains two parts, appendix 1 is an overview over all stations and all elements provided in the REWARD dataset. Appendix 2 lists the stations separately for each element. Appendix 2 will be provided with the data to support computer-handling. All parts of the station catalogue contain the name of the station, country code, REWARD-number and WMO-number to identify the stations. A full description is given in the appendices (Appendices 1 and 2).

The elements are numbered according to NACD data dictionary :

Number	Element	Unit	Abbreviation
111	mean maximum temperature	0.1 °C	Tx
112	highest maximum temperature	0.1 °C	Th
113	day of Th	date	Thd
121	mean minimum temperature	0.1 °C	Tn
122	lowest minimum temperature	0.1 °C	TI
123	day of TI	date	TId
602	maximum 1-day precipitation	0.1 mm	Rx

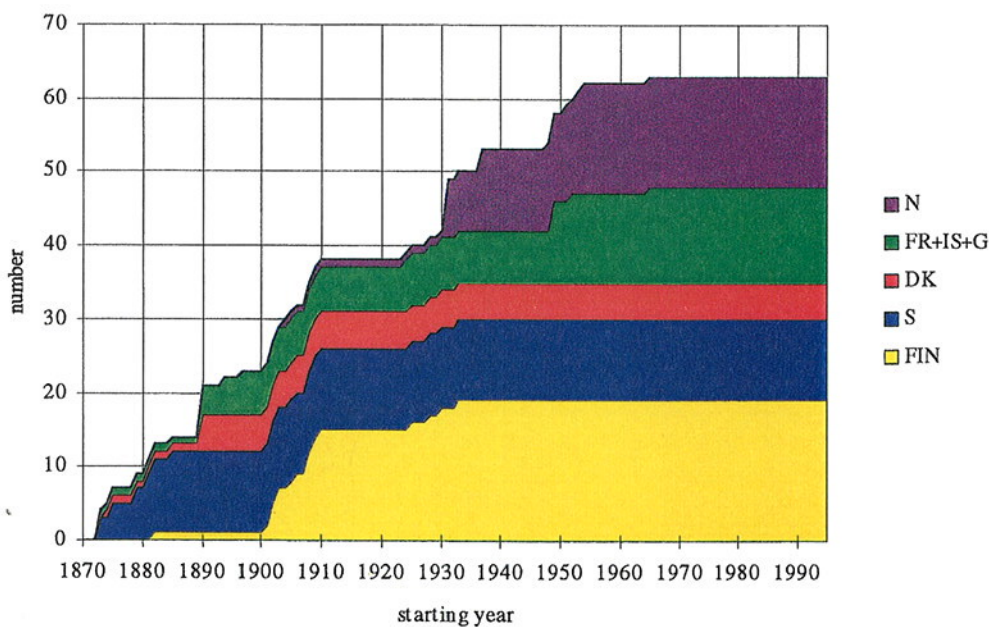


Fig. 3a. Number of stations, mean daily maximum temperature (111)

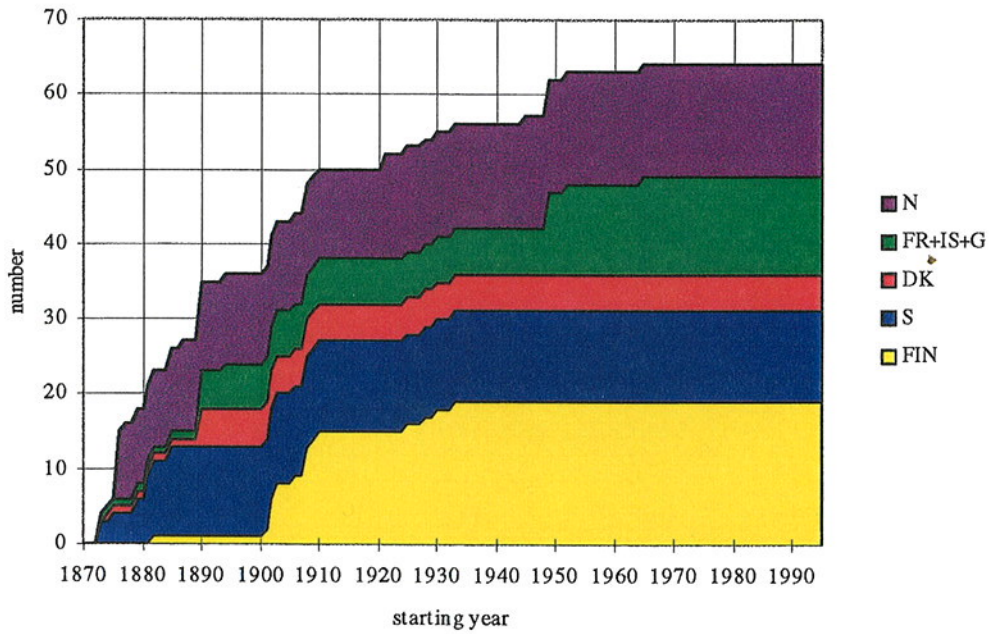


Fig. 3b. Number of stations, mean daily minimum temperature (121)

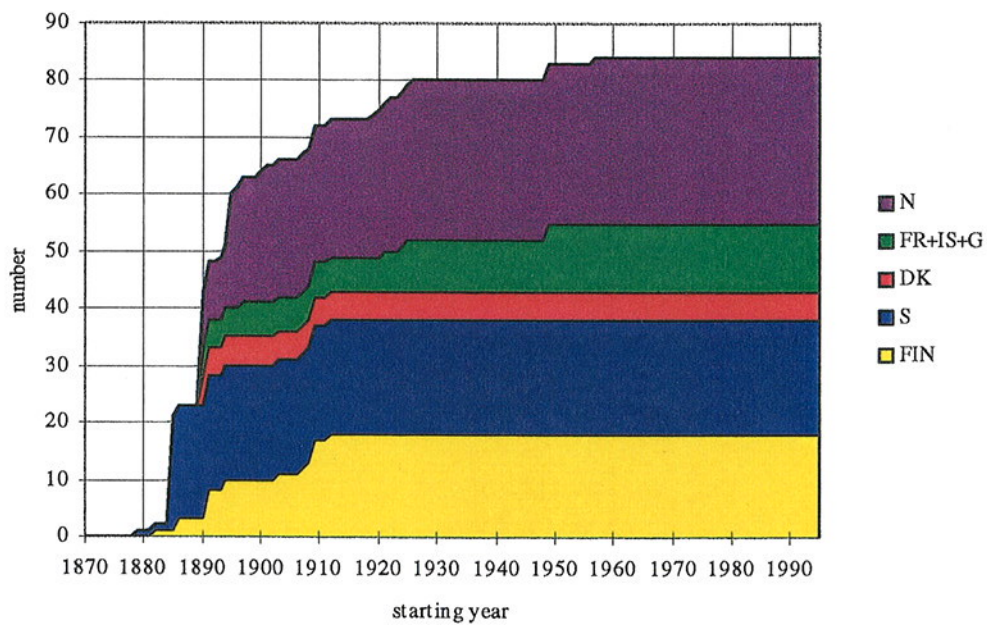


Fig. 3c. Number of stations, maximum 1-day precipitation (602)

The REWARD dataset consists of 7 ASCII files named by the element, rew111.dat, rew112.dat, etc. The data format is the same for all the files. There is no decimal separator. Each record contains data from one year. A full description of the data records is given in the appendix 5.

All files including the appendices as text files can be ordered from the national data advisers. For further information about the data please contact the national data advisers (Appendix 4).



## 5. References

- Dahlström, B., P.Frich, E.J.Førland, R.Heino, T.Jónsson, 1995: *The North Atlantic Climatological Dataset, Research 1993-1995. Final Report*, SMHI September 1995, 28 pp.
- Frich, P., 1994: North Atlantic Climatological Dataset (NACD) - towards an European Climatic Data Centre (ECDC). In: Heino, R. (ed.), *Climate Variations in Europe. Proceedings of the European Workshop held in Kirkkonummi (Majvik), Finland, 15-18 May 1994*. Publications of the Academy of Finland 3/94, 81-96.
- Frich, P. (Co-ordinator), H. Alexandersson, J. Ashcroft, B. Dahlström, G. Demarée, A. Drebs, A. van Engelen, E.J. Førland, I. Hanssen-Bauer, R. Heino, T. Jónsson, K. Jonasson, L. Keegan, Ø. Nordli, T. Schmith, P. Steffensen, H. Tuomenvirta, and O.E. Tveito, 1996: North Atlantic Climatological Dataset (NACD Version 1) - Final Report. *Danish Meteorological Institute, Scientific Report, 96-1*, 47 pp.
- Førland, E.J. (ed), H. Alexandersson, P. Frich, I. Hanssen-Bauer, R. Heino, J. Helminen, T. Jónsson, Ø. Nordli, T. Palsdottir, T. Schmith, H. Tuomenvirta, O.E. Tveito, 1996: REWARD: Relating Extreme Weather to Atmospheric circulation using a Regionalised Dataset. Progress Report 01.01.1996 - 30.09.1996. *DNMI-Report 30/96 KLIMA*, 14 pp.
- Førland, E.J. (ed.), H. Alexandersson, P. Frich, I. Hanssen-Bauer, R. Heino, J. Helminen, T. Jónsson, Ø. Nordli, T. Palsdottir, T. Schmith, H. Tuomenvirta, O.E. Tveito, 1998a: REWARD: Relating Extreme Weather to Atmospheric circulation using a Regionalised Dataset. Final Report (1996-1998). *DNMI-Report 17/98 KLIMA*.
- Førland, E.J., H. Alexandersson, A. Drebs, I. Hanssen-Bauer, O.E. Tveito, H. Vedin, 1998b: Trends in maximum 1-day precipitation. *DNMI-Report 14/98 KLIMA*.
- Nicholls, N., F. Giorgi, H. Grassl, G.A. Meehl, J.F.B. Mitchell, R.J. Stouffer, T. Tokioika, A.J. Weaver, and T.M.L. Wigley, 1996: Climate Models - Projections of Future Climate. In: Houghton, J.T., L.G. Meira Filho, B.A. Callander, N. Harris, A. Kattenberg and K. Maskell (Eds.), *Climate Change 1995 - The Science of Climate Change*, Cambridge University Press. 285-357.
- Tuomenvirta, H., H. Alexandersson, A. Drebs, P. Frich, P.Ø. Nordli, 1998: Trends in Nordic and Arctic extreme temperatures, *DNMI-Report 13/98 KLIMA*.
- Tveito, O.E., R.Heino, H.Vedin, 1998: Nordic Atlas of Climatic Extremes. *DNMI-Report 15/98 KLIMA*.

## Appendix 1: Station Catalogue

Station name	Init	Reward number	WMO number	Lat./Long.	element number						
					111	112	113	121	122	123	602
<b>Denmark</b>											
Vestervig	VEST	21100		56 46 N 08 19 E	1890	1890		1890	1890		1890
Nordby	NORD	25140		55 26 N 08 24 E	1874	1874		1874	1874		1890
Tranebjerg	TRAN	27080		55 51 N 10 36 E	1890	1890		1890	1890		1890
København	KØBE	30380	6186	55 41 N 12 32 E	1890	1890		1890	1890		1890
Hammerodde Fyr	HAMM	06193	6193	55 18 N 14 47 E	1890	1890		1890	1890		1890
<b>Finland</b>											
Maarianhamina	MAAR	00001		60 07 N 19 54 E	1908	1908	1908	1908	1908	1908	
Helsinki	HELS	00304	2978	60 10 N 24 57 E	1882	1882	1882	1882	1882	1882	1882
Turku	TURK	01101	2972	60 31 N 22 16 E	1903	1903	1903	1902	1903	1903	1891
Huittinen	HUIT	01103		61 10 N 22 47 E	1901	1901	1901	1901	1901	1901	1894
Tampere	TAMP	01202		61 28 N 23 45 E	1902	1902	1902	1902	1902	1902	1891
Hattula	HATT	01303		61 04 N 24 14 E	1925	1925	1925	1925	1925	1925	
Heinola	HEIN	01506		61 13 N 26 03 E	1909	1909	1909	1909	1909	1909	
Virolahti	VIRO	01601		60 32 N 27 33 E							1894
Lappeenranta	LAPP	01701	2958	61 05 N 28 09 E	1906	1906	1906	1906	1906	1906	1886
Lavia	LAVI	02104		61 37 N 22 33 E							1903
Virrat	VIIR	02211		61 13 N 23 50 E							1909
Orivesi	ORIV	02306		61 33 N 24 32 E							1909
Jyväskylä	JYVÄ	02425		62 12 N 25 43 E	1902	1902	1902	1902	1902	1902	1891
Vaasa	VAAS	03001		63 03 N 21 46 E	1908	1908	1908	1908	1908	1908	
Ylistaro	YLIS	03101		62 56 N 22 30 E	1928	1928	1928	1928	1928	1928	
Ähtäri	ÄHTÄ	03301	2924	62 32 N 24 13 E	1910	1910	1910	1910	1910	1910	
Kuopio	KUOP	03602		62 54 N 27 41 E	1902	1902	1902	1902	1902	1902	1891
Maaninka	MAAN	03603		63 09 N 27 19 E	1930	1930	1930	1930	1930	1930	
Joensuu	JOEN	03801	2929	62 40 N 29 38 E	1933	1933	1933	1933	1933	1933	
Kestilä	KEST	04509		64 21 N 26 17 E							1909
Kajaani	KAJA	04601	2897	64 17 N 27 40 E	1903	1903	1903	1903	1903	1903	1886
Oulu	OULU	05404		65 02 N 25 29 E	1905	1905	1905	1903	1905	1905	1891
Yli-Ii	YLII	05407		65 22 N 25 51 E							1912
Pudasjärvi	PUDA	05605		65 06 N 27 32 E							1909
Kuusamo	KUUS	06801	2869	65 59 N 29 13 E	1909	1909	1908	1908	1908	1908	1908
Sodankylä	SODA	07501	2839	67 22 N 26 39 E	1908	1908	1908	1908	1908	1908	1907
<b>Faroe Islands</b>											
Torshavn	TORS	06011	6011	62 01 N 06 46 W	1873	1873		1873	1873		1890
<b>Greenland</b>											
Upernavik	UPER	04210	4210	72 47 N 56 10 W	1890	1890		1890	1890		1949
Ilulissat Airport	ILUL	04221	4221	69 15 N 54 04 W	1894	1890		1890	1890		
Nuuk	NUUK	04250	4250	64 10 N 51 45 W	1890	1890		1890	1890		1921
Narsarsuaq	NARS	04270	4270	61 12 N 48 10 W	1890	1890		1890	1890		1890
Danmarkshavn	DANM	04320	4320	76 46 N 18 46 W	1949	1949		1949	1949		1949
Ittoqortoormiit	ITTO	04339	4339	70 29 N 22 00 W	1924	1924		1949	1949		1949
Tasiilaq	TASI	04360	4360	65 36 N 37 38 W	1897	1894		1894	1894		1897
<b>Iceland</b>											
Stykkisholmur	STYK	04013	4013	65 05 N 22 44 W	1952	1952	1952	1952	1952	1952	1890
Reykjavik	REYK	04030	4030	64 08 N 21 54 W	1949	1949	1949	1949	1949	1949	1924
Vestmannaeyar	VEST	04048	4048	63 24 N 20 17 W	1949	1954	1949	1949	1949	1949	1890
Akureyri	AKUR	04063	4063	65 41 N 18 05 W	1949	1949	1949	1949	1949	1949	1925
Teigarhorn	TEIG	04092	4092	64 18 N 15 12 W	1965	1965	1965	1965	1965	1965	1890
<b>Norway</b>											
Halden	HALD	01230		59 07 N 11 23 E							1895
Nord-Odal	ODAL	05350		60 23 N 11 33 E							1895
Skjåk	SKJÅ	15660		61 54 N 08 10 E							1896
Kjøremsgrendi	KJØR	16740	1235	62 06 N 09 03 E	1931	1931		1876	1890		1890
Oslo-Blindern	OSLO	18700	1492	59 57 N 10 43 E	1937	1890		1876	1890		1890
Reinli	REIN	22840		60 50 N 09 46 E							1895
Nesbyen	NESB	24880	1372	60 34 N 09 07 E	1954	1954		1897	1897		1897
Ferder Fyr	FERD	27500	1482	59 02 N 10 32 E	1931	1931		1885	1890		1890
Oksøy Fyr	OKSØ	39100	1448	58 04 N 08 03 E	1931	1931		1876	1890		1890
Mestad	MEST	39220		58 13 N 07 54 E							1900
Nedstrand	NEDS	47020		59 21 N 05 48 E							1895
Utsira Fyr	UTSI	47300	1403	59 18 N 04 53 E	1931	1931		1876	1890		1920
Samnanger	SAMN	50350		60 28 N 05 54 E							1901
Bergen-Florida	BERG	50540	1317	60 23 N 05 20 E	1904	1890		1876	1890		1890
Lørdal	LØRD	54130	1355	61 04 N 07 31 E	1953	1953		1876	1890		1890
Vetti	VETT	54900		61 00 N 07 01 E							1895
Ørskog	ØRSK	60800		62 29 N 06 49 E							1895
Ona	ONA	62480	1212	62 52 N 06 32 E	1931	1931		1876	1890		1919
Lien i Selbu	LIEN	68330		63 13 N 11 07 E							1895
Værnes/Tromsø	VÆRN	69100	1271	63 28 N 12 56 E		1890			1890		1890
Bodø	BODØ	82290	1152	67 16 N 14 26 E		1890			1890		1890
Kråkmo	KRÅK	83500		67 48 N 15 59 E							1895
Tromsø	TROM	90450	1026	69 39 N 18 56 E	1931	1931		1876	1890		1890
Karasjøk	KARA	97250	1065	69 28 N 25 31 E	1950	1950		1877	1890		1890
Varde	VARD	98550	1098	70 22 N 31 05 E	1931	1931		1876	1890		1893
Bjørnsund	BJØS	99450		69 27 N 30 04 E							1895
Bjørnøya	BJØY	99710	1028	74 31 N 19 01 E	1937	1937		1921	1921		1926
Hopen	HOPE	99720	1062	76 30 N 25 04 E	1948	1945		1945	1945		
Svalbard Airport	SVAL	99840	1008	78 15 N 15 28 E		1957			1957		1957
Jan Mayen	JAN	99950	1001	70 56 N 08 40 W	1937	1937		1921	1921		1922
<b>Sweden</b>											
Falun	FALU	10537	2433	60 37 N 15 37 E	1875	1885	1885	1875	1885	1885	1885
Sveg	SVEG	12402	2324	62 01 N 14 21 E		1885	1885		1885	1885	1885
Härnösand	HÄRN	12738		62 37 N 17 56 E	1879	1885	1885	1879	1885	1885	1879
Östersund	ÖSTE	13411	2226	63 11 N 14 29 E	1875	1885	1885	1885	1885	1885	1885
Stensele	STEN	15772		65 04 N 17 09 E	1885	1885		1885	1885		1885
Piteå	PITE	16179		65 32 N 21 29 E							1885
Haparanda	HAPA	16395	2196	65 49 N 24 08 E	1873	1885	1885	1873	1885	1885	1885
Jokkmokk	JOKK	16988	2142	66 37 N 19 38 E	1882	1885	1885	1882	1885	1885	1885
Karesuando	KARE	19283	2080	68 26 N 25 31 E		1885	1885		1885	1885	1885
Lund	LUND	05343		55 42 N 13 12 E							1885
Halmstad	HALM	06240		56 40 N 12 55 E							1885
Växjö	VÄXJ	06452	2640	56 52 N 14 48 E	1873	1885	1885	1873	1885	1885	1885
Kalmar	KALM	06641	2672	56 43 N 16 17 E							1885
Göteborg	GÖTE	07147	2512	57 46 N 11 53 E	1881	1885	1885	1881	1885	1885	1885
Västerвик	VÄST	07647		57 43 N 16 28 E		1885	1885		1885	1885	1885
Visby	VISB	07840	2590	57 40 N 18 20 E	1879	1885	1885	1879	1885	1885	1885
Linköping	LINK	08524	2582	58 40 N 15 32 E							1885
Karlstad	KARL	09322	2418	59 21 N 13 28 E	1881	1885	1885	1881	1885	1885	1885
Västerås	VÄST	09635		59 35 N 16 37 E							1885
Stockholm	STOC	09821	2485	59 20 N 18 03 E	1873	1885	1885	1873	1885	1885	1885

bold = tested or/and homogenous  
normal = not tested

## Appendix 2: REWARD Version 1, Station catalogue (NACD Format)

### Format of the data record:

Position	Format	Variable
1-5	I5	REWARD number = National number, any system
7-9	A3	Country = Country code (see description below)
11-15	I5	WMO no. = Official station number from WMO INFOCLIMA
17-36	A20	Name = Official name of station
38-44	I2+I2+A1	Latitude = Degrees and minutes N or S
46-53	I2+I2+A1	Longitude = Degrees and minutes E or W
55-58	I4	Altitude = Height above mean sea level in meters
60-63	I4	Start = Start year of the station (any element)
65-67	I3	Element = Element number from the data dictionary
69-72	I4	Begin = First year of element in data file
74	A1	Status = Status of element in data file (see description below)

Country code	Country
DK	Denmark
FIN	Finland
FR	Faeroe Islands
G	Greenland
IS	Iceland
N	Norway
S	Sweden

Status code	Description
H	Homogenous, rigorously tested and maybe adjusted
T	Tested, maybe adjusted but not perfectly homogenous
N	Not tested, but not necessarily inhomogenous
E	Environmental changes prevents climatic change studies
I	Inhomogenous series which is presently unjustable

## Appendix 2: Station catalogue ctd.

REWARD number	Ctry code	WMO number	STATION NAME	Latitude	Longitude	Altitude m a.s.l.	Start	Element	Begin	Status
6193	DK	6193	HAMMERODDE FYR	55 18 N	14 47 E	11	1853	111	1890	T
21100	DK	-9999	VESTERVIG	56 46 N	8 19 E	18	1873	111	1890	T
25140	DK	-9999	NORDBY	55 26 N	8 24 E	5	1872	111	1890	T
27080	DK	-9999	TRANEBJERG	55 51 N	10 36 E	11	1838	111	1890	T
30380	DK	6186	KOEBENHAVN	55 41 N	12 32 E	9	1751	111	1890	T
1	FIN	-9999	MAARIANHAMINA	60 7 N	19 54 E	4	1869	111	1908	H
304	FIN	2978	HELSINKI	60 10 N	24 57 E	4	1829	111	1882	T
1101	FIN	2972	TURKU	60 31 N	22 16 E	51	1873	111	1903	H
1103	FIN	-9999	HUITTINEN	61 10 N	22 47 E	69	1894	111	1901	H
1202	FIN	-9999	TAMPERE	61 28 N	23 45 E	85	1873	111	1902	T
1303	FIN	-9999	HATTULA	61 4 N	24 14 E	88	1925	111	1925	H
1506	FIN	-9999	HEINOLA	61 13 N	26 3 E	109	1909	111	1909	H
1701	FIN	2958	LAPPEENRANTA	61 5 N	28 9 E	105	1886	111	1906	T
2425	FIN	-9999	JYVAESKYLAE	62 12 N	25 43 E	137	1883	111	1902	T
3001	FIN	-9999	VAASA	63 3 N	21 46 E	4	1882	111	1908	H
3101	FIN	-9999	YLISTARO	62 56 N	22 30 E	26	1928	111	1928	H
3301	FIN	2924	AEHTAERI	62 32 N	24 13 E	157	1919	111	1910	H
3602	FIN	-9999	KUOPIO	62 54 N	27 41 E	119	1846	111	1902	T
3603	FIN	-9999	MAANINKA	63 9 N	27 19 E	88	1939	111	1930	H
3801	FIN	2929	JOENSUU	62 40 N	29 38 E	116	1933	111	1933	H
4601	FIN	2897	KAJAANI	64 17 N	27 40 E	132	1846	111	1903	H
5404	FIN	-9999	OULU	65 2 N	25 29 E	13	1846	111	1905	T
6801	FIN	2869	KUUSAMO	65 59 N	29 13 E	263	1908	111	1909	H
7501	FIN	2839	SODANKYLAE	67 22 N	26 39 E	179	1908	111	1908	H
6011	FR	6011	TORSHAVN	62 1 N	6 46 W	43	1873	111	1890	T
4210	G	4210	UPERNAVIK	72 47 N	56 10 W	63	1873	111	1890	N
4221	G	4221	ILULISSAT AIRPORT	69 15 N	54 4 W	25	1866	111	1894	N
4250	G	4250	NUUK	64 10 N	51 45 W	59	1866	111	1890	N
4270	G	4270	NARSARSUAQ	61 12 N	48 10 W	39	1866	111	1890	N
4320	G	4320	DANMARKSHAVN	76 46 N	18 46 W	11	1949	111	1949	N
4339	G	4339	ITTOQQORTOOMIIT	70 29 N	22 0 W	65	1924	111	1924	N
4360	G	4360	TASIILAQ	65 36 N	37 38 W	59	1895	111	1897	N
4030	IS	4030	REYKJAVIK	64 8 N	21 54 W	52	1823	111	1949	
4013	IS	4013	STYKKISHOLMUR	65 5 N	22 44 W	8	1845	111	1952	
4063	IS	4063	AKUREYRI	65 41 N	18 5 W	23	1882	111	1949	
4092	IS	4092	TEIGARHORN	64 18 N	15 12 W	14	1872	111	1965	
4048	IS	4048	VESTMANNAEYAR	63 24 N	20 17 W	118	1877	111	1949	
16740	N	1235	KJOEREMSGRENDI	62 6 N	9 3 E	626	1864	111	1931	T
18700	N	1492	OSLO-BLINDERN	59 57 N	10 43 E	94	1837	111	1937	T
24880	N	1372	NESBYEN	60 34 N	9 7 E	167	1895	111	1954	T
27500	N	1482	FERDER FYR	59 2 N	10 32 E	6	1885	111	1931	T
39100	N	1448	OKSOEY FYR	58 4 N	8 3 E	9	1869	111	1931	T
47300	N	1403	UTSIRA FYR	59 18 N	4 53 E	55	1867	111	1931	T
50540	N	1317	BERGEN-FLORIDA	60 23 N	5 20 E	12	1861	111	1904	T
54130	N	1355	LAERDAL	61 4 N	7 31 E	36	1869	111	1953	T
62480	N	1212	ONA	62 52 N	6 32 E	13	1868	111	1931	T
90450	N	1026	TROMSOE	69 39 N	18 56 E	109	1867	111	1931	T
97250	N	1065	KARASJOK	69 28 N	25 31 E	129	1877	111	1950	T
98550	N	1098	VARDOE	70 22 N	31 5 E	14	1867	111	1931	T
99710	N	1028	BJOERNOEYA	74 31 N	19 1 E	16	1919	111	1937	T
99720	N	1062	HOPEN	76 30 N	25 4 E	6	1945	111	1949	T
99950	N	1001	JAN MAYEN	70 56 N	8 40 W	19	1921	111	1937	T

REWARD number	Ctry code	WMO number	STATION NAME	Lat.	Long.	Altitude m a.s.l.	Start	Element	Begin	Status
6452	S	2640	VAEXJOE	56 52 N	14 48 E	166	1869	111	1873	N
7147	S	2512	GOETEBORG	57 46 N	11 53 E	29	1869	111	1881	N
7840	S	2590	VISBY	57 40 N	18 20 E	42	1869	111	1879	N
9322	S	2418	KARLSTAD	59 21 N	13 28 E	46	1859	111	1881	N
9821	S	2485	STOCKHOLM	59 20 N	18 3 E	44	1756	111	1873	N
10537	S	2433	FALUN	60 37 N	15 37 E	169	1869	111	1875	N
12738	S	-9999	HAERNOESAND	62 37 N	17 56 E	8	1859	111	1879	N
13411	S	2226	OESTERSUND	63 11 N	14 29 E	376	1869	111	1875	N
16395	S	2196	HAPARANDA	65 49 N	24 8 E	5	1869	111	1873	N
16988	S	2142	JOKKMOKK	66 37 N	19 38 E	269	1869	111	1882	N
15772	S	-9999	STENSELE	65 4 N	17 9 E	325	1861	111	1885	N
6193	DK	6193	HAMMERODDE FYR	55 18 N	14 47 E	11	1853	112	1890	T
21100	DK	-9999	VESTERVIG	56 46 N	8 19 E	18	1873	112	1890	T
25140	DK	-9999	NORDBY	55 26 N	8 24 E	5	1872	112	1890	T
27080	DK	-9999	TRANEBJERG	55 51 N	10 36 E	11	1838	112	1890	T
30380	DK	6186	KOEBENHAVN	55 41 N	12 32 E	9	1751	112	1890	T
1	FIN	-9999	MAARIANHAMINA	60 7 N	19 54 E	4	1869	112	1908	N
304	FIN	2978	HELSINKI	60 10 N	24 57 E	4	1829	112	1882	N
1101	FIN	2972	TURKU	60 31 N	22 16 E	51	1873	112	1903	N
1103	FIN	-9999	HUITTINEN	61 10 N	22 47 E	69	1894	112	1901	N
1202	FIN	-9999	TAMPERE	61 28 N	23 45 E	85	1873	112	1902	N
1303	FIN	-9999	HATTULA	61 4 N	24 14 E	88	1925	112	1925	N
1506	FIN	-9999	HEINOLA	61 13 N	26 3 E	109	1909	112	1909	N
1701	FIN	2958	LAPPEENRANTA	61 5 N	28 9 E	105	1886	112	1906	N
2425	FIN	-9999	JYVAESKYLAE	62 12 N	25 43 E	137	1883	112	1902	N
3001	FIN	-9999	VAASA	63 3 N	21 46 E	4	1882	112	1908	N
3101	FIN	-9999	YLISTARO	62 56 N	22 30 E	26	1928	112	1928	N
3301	FIN	2924	AEHTAERI	62 32 N	24 13 E	157	1919	112	1910	N
3602	FIN	-9999	KUOPIO	62 54 N	27 41 E	119	1846	112	1902	N
3603	FIN	-9999	MAANINKA	63 9 N	27 19 E	88	1939	112	1930	N
3801	FIN	2929	JOENSUU	62 40 N	29 38 E	116	1933	112	1933	N
4601	FIN	2897	KAJAANI	64 17 N	27 40 E	132	1846	112	1903	N
5404	FIN	-9999	OULU	65 2 N	25 29 E	13	1846	112	1905	N
6801	FIN	2869	KUUSAMO	65 59 N	29 13 E	263	1908	112	1909	N
7501	FIN	2839	SODANKYLAE	67 22 N	26 39 E	179	1908	112	1908	N
6011	FR	6011	TORSHAVN	62 1 N	6 46 W	43	1873	112	1890	T
4210	G	4210	UPERNAVIK	72 47 N	56 10 W	63	1873	112	1890	N
4221	G	4221	ILULISSAT AIRPORT	69 15 N	54 4 W	25	1866	112	1894	N
4250	G	4250	NUUK	64 10 N	51 45 W	59	1866	112	1890	N
4270	G	4270	NARSARSUAQ	61 12 N	48 10 W	39	1866	112	1890	N
4320	G	4320	DANMARKSHAVN	76 46 N	18 46 W	11	1949	112	1949	N
4339	G	4339	ITTOQQORTOOMIIT	70 29 N	22 0 W	65	1924	112	1924	N
4360	G	4360	TASILAQ	65 36 N	37 38 W	59	1895	112	1894	N
4030	IS	4030	REYKJAVIK	64 8 N	21 54 W	52	1823	112	1949	
4013	IS	4013	STYKKISHOLMUR	65 5 N	22 44 W	8	1845	112	1949	
4063	IS	4063	AKUREYRI	65 41 N	18 5 W	23	1882	112	1949	
4092	IS	4092	TEIGARHORN	64 18 N	15 12 W	14	1872	112	1949	
4048	IS	4048	VESTMANNAEYAR	63 24 N	20 17 W	118	1877	112	1949	
16740	N	1235	KJOEREMSGRENDI	62 6 N	9 3 E	626	1864	112	1890	N
18700	N	1492	OSLO-BLINDERN	59 57 N	10 43 E	94	1837	112	1890	N
24880	N	1372	NESBYEN	60 34 N	9 7 E	167	1895	112	1897	N
27500	N	1482	FERDER FYR	59 2 N	10 32 E	6	1885	112	1890	N
39100	N	1448	OKSOEY FYR	58 4 N	8 3 E	9	1869	112	1890	N
47300	N	1403	UTSIRA FYR	59 18 N	4 53 E	55	1867	112	1890	N
50540	N	1317	BERGEN-FLORIDA	60 23 N	5 20 E	12	1861	112	1890	N

REWARD number	Ctry code	WMO number	STATION NAME	Lat.	Long.	Altitude m a.s.l.	Start	Element	Begin	Status
54130	N	1355	LAERDAL	61 4 N	7 31 E	36	1869	112	1890	N
62480	N	1212	ONA	62 52 N	6 32 E	13	1868	112	1890	N
69100	N	1271	VAERNES/TRONDHEIM	63 28 N	10 56 E	12	1761	112	1890	N
82290	N	1152	BODOE	67 16 N	14 26 E	11	1867	112	1890	N
90450	N	1026	TROMSOE	69 39 N	18 56 E	109	1867	112	1890	N
97250	N	1065	KARASJOK	69 28 N	25 31 E	129	1877	112	1890	N
98550	N	1098	VARDOE	70 22 N	31 5 E	14	1867	112	1890	N
99710	N	1028	BJOERNOEYA	74 31 N	19 1 E	16	1919	112	1921	N
99720	N	1062	HOPEN	76 30 N	25 4 E	6	1945	112	1949	N
99840	N	1008	SVALBARD AIRPORT	78 15 N	15 28 E	28	1911	112	1957	N
99950	N	1001	JAN MAYEN	70 56 N	8 40 W	19	1921	112	1921	N
6452	S	2640	VAEXJOE	56 52 N	14 48 E	166	1869	112	1885	N
7147	S	2512	GOETEBORG	57 46 N	11 53 E	29	1869	112	1885	N
7647	S	-9999	VAESTERVIK	57 43 N	16 28 E	33	1885	112	1885	N
7840	S	2590	VISBY	57 40 N	18 20 E	42	1869	112	1885	N
9322	S	2418	KARLSTAD	59 21 N	13 28 E	46	1859	112	1885	N
9821	S	2485	STOCKHOLM	59 20 N	18 3 E	44	1756	112	1885	N
10537	S	2433	FALUN	60 37 N	15 37 E	169	1869	112	1885	N
12402	S	2324	SVEG	62 1 N	14 21 E	369	1875	112	1885	N
12738	S	-9999	HAERNOESAND	62 37 N	17 56 E	8	1859	112	1885	N
13411	S	2226	OESTERSUND	63 11 N	14 29 E	376	1869	112	1885	N
16395	S	2196	HAPARANDA	65 49 N	24 8 E	5	1869	112	1885	N
16988	S	2142	JOKKMOKK	66 37 N	19 38 E	269	1869	112	1885	N
19283	S	2080	KARESUANDO	68 26 N	22 29 E	327	1879	112	1885	N
15772	S	-9999	STENSELE	65 4 N	17 9 E	325	1861	112	1885	N
1	FIN	-9999	MAARIANHAMINA	60 7 N	19 54 E	4	1869	113	1908	N
304	FIN	2978	HELSINKI	60 10 N	24 57 E	4	1829	113	1882	N
1101	FIN	2972	TURKU	60 31 N	22 16 E	51	1873	113	1903	N
1103	FIN	-9999	HUITTINEN	61 10 N	22 47 E	69	1894	113	1901	N
1202	FIN	-9999	TAMPERE	61 28 N	23 45 E	85	1873	113	1902	N
1303	FIN	-9999	HATTULA	61 4 N	24 14 E	88	1925	113	1925	N
1506	FIN	-9999	HEINOLA	61 13 N	26 3 E	109	1909	113	1909	N
1701	FIN	2958	LAPPEENRANTA	61 5 N	28 9 E	105	1886	113	1906	N
2425	FIN	-9999	JYVAESKYLAE	62 12 N	25 43 E	137	1883	113	1902	N
3001	FIN	-9999	VAASA	63 3 N	21 46 E	4	1882	113	1908	N
3101	FIN	-9999	YLISTARO	62 56 N	22 30 E	26	1928	113	1928	N
3301	FIN	2924	AEHTAERI	62 32 N	24 13 E	157	1919	113	1910	N
3602	FIN	-9999	KUOPIO	62 54 N	27 41 E	119	1846	113	1902	N
3603	FIN	-9999	MAANINKA	63 9 N	27 19 E	88	1939	113	1930	N
3801	FIN	2929	JOENSUU	62 40 N	29 38 E	116	1933	113	1933	N
4601	FIN	2897	KAJAANI	64 17 N	27 40 E	132	1846	113	1903	N
5404	FIN	-9999	OULU	65 2 N	25 29 E	13	1846	113	1905	N
6801	FIN	2869	KUUSAMO	65 59 N	29 13 E	263	1908	113	1909	N
7501	FIN	2839	SODANKYLAE	67 22 N	26 39 E	179	1908	113	1908	N
4030	IS	4030	REYKJAVIK	64 8 N	21 54 W	52	1823	113	1949	
4013	IS	4013	STYKKISHOLMUR	65 5 N	22 44 W	8	1845	113	1949	
4063	IS	4063	AKUREYRI	65 41 N	18 5 W	23	1882	113	1949	
4092	IS	4092	TEIGARHORN	64 18 N	15 12 W	14	1872	113	1949	
4048	IS	4048	VESTMANNAEYAR	63 24 N	20 17 W	118	1877	113	1949	
6452	S	2640	VAEXJOE	56 52 N	14 48 E	166	1869	113	1885	N
7147	S	2512	GOETEBORG	57 46 N	11 53 E	29	1869	113	1885	N
7647	S	-9999	VAESTERVIK	57 43 N	16 28 E	33	1885	113	1885	N
7840	S	2590	VISBY	57 40 N	18 20 E	42	1869	113	1885	N
9322	S	2418	KARLSTAD	59 21 N	13 28 E	46	1859	113	1885	N
9821	S	2485	STOCKHOLM	59 20 N	18 3 E	44	1756	113	1885	N

REWARD number	Ctry code	WMO number	STATION NAME	Lat.	Long.	Altitude m a.s.l.	Start	Element	Begin	Status
10537	S	2433	FALUN	60 37 N	15 37 E	169	1869	113	1885	N
12402	S	2324	SVEG	62 1 N	14 21 E	369	1875	113	1885	N
12738	S	-9999	HAERNOESAND	62 37 N	17 56 E	8	1859	113	1885	N
13411	S	2226	OESTERSUND	63 11 N	14 29 E	376	1869	113	1885	N
16395	S	2196	HAPARANDA	65 49 N	24 8 E	5	1869	113	1885	N
16988	S	2142	JOKKMOKK	66 37 N	19 38 E	269	1869	113	1885	N
19283	S	2080	KARESUANDO	68 26 N	22 29 E	327	1879	113	1885	N
15772	S	-9999	STENSELE	65 4 N	17 9 E	325	1861	113	1885	N
6193	DK	6193	HAMMERODDE FYR	55 18 N	14 47 E	11	1853	121	1890	T
21100	DK	-9999	VESTERVIG	56 46 N	8 19 E	18	1873	121	1890	T
25140	DK	-9999	NORDBY	55 26 N	8 24 E	5	1872	121	1890	T
27080	DK	-9999	TRANEBJERG	55 51 N	10 36 E	11	1838	121	1890	T
30380	DK	6186	KOEBENHAVN	55 41 N	12 32 E	9	1751	121	1890	T
1	FIN	-9999	MAARIANHAMINA	60 7 N	19 54 E	4	1869	121	1908	H
304	FIN	2978	HELSINKI	60 10 N	24 57 E	4	1829	121	1882	T
1101	FIN	2972	TURKU	60 31 N	22 16 E	51	1873	121	1903	H
1103	FIN	-9999	HUITTINEN	61 10 N	22 47 E	69	1894	121	1901	H
1202	FIN	-9999	TAMPERE	61 28 N	23 45 E	85	1873	121	1902	T
1303	FIN	-9999	HATTULA	61 4 N	24 14 E	88	1925	121	1925	H
1506	FIN	-9999	HEINOLA	61 13 N	26 3 E	109	1909	121	1909	H
1701	FIN	2958	LAPPEENRANTA	61 5 N	28 9 E	105	1886	121	1906	T
2425	FIN	-9999	JYVAESKYLAE	62 12 N	25 43 E	137	1883	121	1902	T
3001	FIN	-9999	VAASA	63 3 N	21 46 E	4	1882	121	1908	H
3101	FIN	-9999	YLISTARO	62 56 N	22 30 E	26	1928	121	1928	H
3301	FIN	2924	AEHTAERI	62 32 N	24 13 E	157	1919	121	1910	H
3602	FIN	-9999	KUOPIO	62 54 N	27 41 E	119	1846	121	1902	T
3603	FIN	-9999	MAANINKA	63 9 N	27 19 E	88	1939	121	1930	H
3801	FIN	2929	JOENSUU	62 40 N	29 38 E	116	1933	121	1933	H
4601	FIN	2897	KAJAANI	64 17 N	27 40 E	132	1846	121	1903	H
5404	FIN	-9999	OULU	65 2 N	25 29 E	13	1846	121	1905	T
6801	FIN	2869	KUUSAMO	65 59 N	29 13 E	263	1908	121	1909	H
7501	FIN	2839	SODANKYLAE	67 22 N	26 39 E	179	1908	121	1908	H
6011	FR	6011	TORSHAVN	62 1 N	6 46 W	43	1873	121	1890	T
4210	G	4210	UPERNAVIK	72 47 N	56 10 W	63	1873	121	1890	N
4221	G	4221	ILULISSAT AIRPORT	69 15 N	54 4 W	25	1866	121	1890	N
4250	G	4250	NUUK	64 10 N	51 45 W	59	1866	121	1890	N
4270	G	4270	NARSARSUAQ	61 12 N	48 10 W	39	1866	121	1890	N
4320	G	4320	DANMARKSHAVN	76 46 N	18 46 W	11	1949	121	1949	N
4339	G	4339	ITTOQQORTOOMIIT	70 29 N	22 0 W	65	1924	121	1949	N
4360	G	4360	TASIILAQ	65 36 N	37 38 W	59	1895	121	1894	N
4030	IS	4030	REYKJAVIK	64 8 N	21 54 W	52	1823	121	1949	
4013	IS	4013	STYKKISHOLMUR	65 5 N	22 44 W	8	1845	121	1949	
4063	IS	4063	AKUREYRI	65 41 N	18 5 W	23	1882	121	1949	
4092	IS	4092	TEIGARHORN	64 18 N	15 12 W	14	1872	121	1949	
4048	IS	4048	VESTMANNAEYAR	63 24 N	20 17 W	118	1877	121	1949	
16740	N	1235	KJOEREMSGRENDI	62 6 N	9 3 E	626	1864	121	1876	T
18700	N	1492	OSLO-BLINDERN	59 57 N	10 43 E	94	1837	121	1876	T
24880	N	1372	NESBYEN	60 34 N	9 7 E	167	1895	121	1897	T
27500	N	1482	FERDER FYR	59 2 N	10 32 E	6	1885	121	1885	T
39100	N	1448	OKSOEY FYR	58 4 N	8 3 E	9	1869	121	1876	T
47300	N	1403	UTSIRA FYR	59 18 N	4 53 E	55	1867	121	1876	T
50540	N	1317	BERGEN-FLORIDA	60 23 N	5 20 E	12	1861	121	1876	T
54130	N	1355	LAERDAL	61 4 N	7 31 E	36	1869	121	1876	T
62480	N	1212	ONA	62 52 N	6 32 E	13	1868	121	1876	T
90450	N	1026	TROMSOE	69 39 N	18 56 E	109	1867	121	1876	T

REWARD number	Ctry code	WMO number	STATION NAME	Lat.	Long.	Altitude m a.s.l.	Start	Element	Begin	Status
97250	N	1065	KARASJOK	69 28 N	25 31 E	129	1877	121	1877	T
98550	N	1098	VARDOE	70 22 N	31 5 E	14	1867	121	1876	T
99710	N	1028	BJOERNOEYA	74 31 N	19 1 E	16	1919	121	1921	T
99720	N	1062	HOPEN	76 30 N	25 4 E	6	1945	121	1949	T
99950	N	1001	JAN MAYEN	70 56 N	8 40 W	19	1921	121	1921	T
6452	S	2640	VAEXJOE	56 52 N	14 48 E	166	1869	121	1873	N
7147	S	2512	GOETEBORG	57 46 N	11 53 E	29	1869	121	1881	N
7840	S	2590	VISBY	57 40 N	18 20 E	42	1869	121	1879	N
9322	S	2418	KARLSTAD	59 21 N	13 28 E	46	1859	121	1881	N
9821	S	2485	STOCKHOLM	59 20 N	18 3 E	44	1756	121	1873	N
10537	S	2433	FALUN	60 37 N	15 37 E	169	1869	121	1875	N
12738	S	-9999	HAERNOESAND	62 37 N	17 56 E	8	1859	121	1879	N
13411	S	2226	OESTERSUND	63 11 N	14 29 E	376	1869	121	1875	N
16395	S	2196	HAPARANDA	65 49 N	24 8 E	5	1869	121	1873	N
16988	S	2142	JOKKMOKK	66 37 N	19 38 E	269	1869	121	1882	N
15772	S	-9999	STENSELE	65 4 N	17 9 E	325	1861	121	1885	N
6193	DK	6193	HAMMERODDE FYR	55 18 N	14 47 E	11	1853	122	1890	T
21100	DK	-9999	VESTERVIG	56 46 N	8 19 E	18	1873	122	1890	T
25140	DK	-9999	NORDBY	55 26 N	8 24 E	5	1872	122	1890	T
27080	DK	-9999	TRANEBJERG	55 51 N	10 36 E	11	1838	122	1890	T
30380	DK	6186	KOEBENHAVN	55 41 N	12 32 E	9	1751	122	1890	T
1	FIN	-9999	MAARIANHAMINA	60 7 N	19 54 E	4	1869	122	1908	N
304	FIN	2978	HELSINKI	60 10 N	24 57 E	4	1829	122	1882	N
1101	FIN	2972	TURKU	60 31 N	22 16 E	51	1873	122	1903	N
1103	FIN	-9999	HUITTINEN	61 10 N	22 47 E	69	1894	122	1901	N
1202	FIN	-9999	TAMPERE	61 28 N	23 45 E	85	1873	122	1902	N
1303	FIN	-9999	HATTULA	61 4 N	24 14 E	88	1925	122	1925	N
1506	FIN	-9999	HEINOLA	61 13 N	26 3 E	109	1909	122	1909	N
1701	FIN	2958	LAPPEENRANTA	61 5 N	28 9 E	105	1886	122	1906	N
2425	FIN	-9999	JYVAESKYLAE	62 12 N	25 43 E	137	1883	122	1902	N
3001	FIN	-9999	VAASA	63 3 N	21 46 E	4	1882	122	1908	N
3101	FIN	-9999	YLISTARO	62 56 N	22 30 E	26	1928	122	1928	N
3301	FIN	2924	AEHTAERI	62 32 N	24 13 E	157	1919	122	1910	N
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3603	FIN	-9999	MAANINKA	63 9 N	27 19 E	88	1939	122	1930	N
3801	FIN	2929	JOENSUU	62 40 N	29 38 E	116	1933	122	1933	N
4601	FIN	2897	KAJAANI	64 17 N	27 40 E	132	1846	122	1903	N
5404	FIN	-9999	OULU	65 2 N	25 29 E	13	1846	122	1905	N
6801	FIN	2869	KUUSAMO	65 59 N	29 13 E	263	1908	122	1909	N
7501	FIN	2839	SODANKYLAE	67 22 N	26 39 E	179	1908	122	1908	N
6011	FR	6011	TORSHAVN	62 1 N	6 46 W	43	1873	122	1890	T
4210	G	4210	UPERNAVIK	72 47 N	56 10 W	63	1873	122	1890	N
4221	G	4221	ILULISSAT AIRPORT	69 15 N	54 4 W	25	1866	122	1890	N
4250	G	4250	NUUK	64 10 N	51 45 W	59	1866	122	1890	N
4270	G	4270	NARSARSUAQ	61 12 N	48 10 W	39	1866	122	1890	N
4320	G	4320	DANMARKSHAVN	76 46 N	18 46 W	11	1949	122	1949	N
4339	G	4339	ITTOQQORTOOMIIT	70 29 N	22 0 W	65	1924	122	1949	N
4360	G	4360	TASILAQ	65 36 N	37 38 W	59	1895	122	1894	N
4030	IS	4030	REYKJAVIK	64 8 N	21 54 W	52	1823	122	1949	
4013	IS	4013	STYKKISHOLMUR	65 5 N	22 44 W	8	1845	122	1949	
4063	IS	4063	AKUREYRI	65 41 N	18 5 W	23	1882	122	1949	
4092	IS	4092	TEIGARHORN	64 18 N	15 12 W	14	1872	122	1949	
4048	IS	4048	VESTMANNAEYAR	63 24 N	20 17 W	118	1877	122	1949	
16740	N	1235	KJOEREMSGRENDI	62 6 N	9 3 E	626	1864	122	1890	N
18700	N	1492	OSLO-BLINDERN	59 57 N	10 43 E	94	1837	122	1890	N

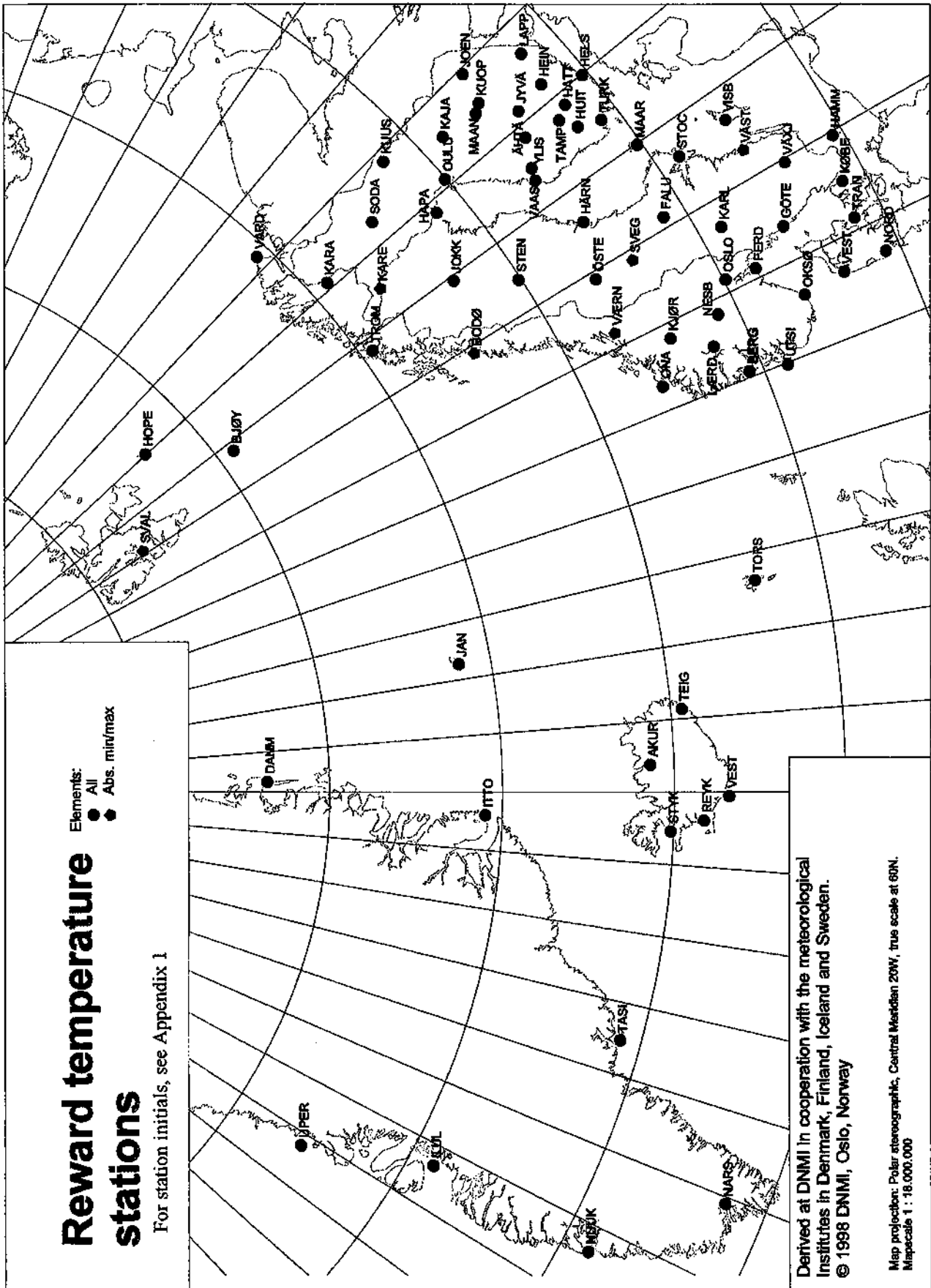


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27500	N	1482	FERDER FYR	59 2 N	10 32 E	6	1885	122	1890	N
39100	N	1448	OKSOEY FYR	58 4 N	8 3 E	9	1869	122	1890	N
47300	N	1403	UTSIRA FYR	59 18 N	4 53 E	55	1867	122	1890	N
50540	N	1317	BERGEN-FLORIDA	60 23 N	5 20 E	12	1861	122	1890	N
54130	N	1355	LAERDAL	61 4 N	7 31 E	36	1869	122	1890	N
62480	N	1212	ONA	62 52 N	6 32 E	13	1868	122	1890	N
69100	N	1271	VAERNES/TRONDHEIM	63 28 N	10 56 E	12	1761	122	1890	N
82290	N	1152	BODOE	67 16 N	14 26 E	11	1867	122	1890	N
90450	N	1026	TROMSOE	69 39 N	18 56 E	109	1867	122	1890	N
97250	N	1065	KARASJOK	69 28 N	25 31 E	129	1877	122	1890	N
98550	N	1098	VARDOE	70 22 N	31 5 E	14	1867	122	1890	N
99710	N	1028	BJOERNOEYA	74 31 N	19 1 E	16	1919	122	1921	N
99720	N	1062	HOPEN	76 30 N	25 4 E	6	1945	122	1945	N
99840	N	1008	SVALBARD AIRPORT	78 15 N	15 28 E	28	1911	122	1957	N
99950	N	1001	JAN MAYEN	70 56 N	8 40 W	19	1921	122	1921	N
6452	S	2640	VAEXJOE	56 52 N	14 48 E	166	1869	122	1885	N
7147	S	2512	GOETEBORG	57 46 N	11 53 E	29	1869	122	1885	N
7647	S	-9999	VAESTERVIK	57 43 N	16 28 E	33	1885	122	1885	N
7840	S	2590	VISBY	57 40 N	18 20 E	42	1869	122	1885	N
9322	S	2418	KARLSTAD	59 21 N	13 28 E	46	1859	122	1885	N
9821	S	2485	STOCKHOLM	59 20 N	18 3 E	44	1756	122	1885	N
10537	S	2433	FALUN	60 37 N	15 37 E	169	1869	122	1885	N
12402	S	2324	SVEG	62 1 N	14 21 E	369	1875	122	1885	N
12738	S	-9999	HAERNOESAND	62 37 N	17 56 E	8	1859	122	1885	N
13411	S	2226	OESTERSUND	63 11 N	14 29 E	376	1869	122	1885	N
16395	S	2196	HAPARANDA	65 49 N	24 8 E	5	1869	122	1885	N
16988	S	2142	JOKKMOKK	66 37 N	19 38 E	269	1869	122	1885	N
19283	S	2080	KARESUANDO	68 26 N	22 29 E	327	1869	122	1885	N
15772	S	-9999	STENSELE	65 4 N	17 9 E	325	1861	122	1885	N
1	FIN	-9999	MAARIANHAMINA	60 7 N	19 54 E	4	1869	123	1908	N
304	FIN	2978	HELSINKI	60 10 N	24 57 E	4	1829	123	1882	N
1101	FIN	2972	TURKU	60 31 N	22 16 E	51	1873	123	1903	N
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1202	FIN	-9999	TAMPERE	61 28 N	23 45 E	85	1873	123	1902	N
1303	FIN	-9999	HATTULA	61 4 N	24 14 E	88	1925	123	1925	N
1506	FIN	-9999	HEINOLA	61 13 N	26 3 E	109	1909	123	1909	N
1701	FIN	2958	LAPPEENRANTA	61 5 N	28 9 E	105	1886	123	1906	N
2425	FIN	-9999	JYVAESKYLAE	62 12 N	25 43 E	137	1883	123	1902	N
3001	FIN	-9999	VAASA	63 3 N	21 46 E	4	1882	123	1908	N
3101	FIN	-9999	YLISTARO	62 56 N	22 30 E	26	1928	123	1928	N
3301	FIN	2924	AEHTAERI	62 32 N	24 13 E	157	1919	123	1910	N
3602	FIN	-9999	KUOPIO	62 54 N	27 41 E	119	1846	123	1902	N
3603	FIN	-9999	MAANINKA	63 9 N	27 19 E	88	1939	123	1930	N
3801	FIN	2929	JOENSUU	62 40 N	29 38 E	116	1933	123	1933	N
4601	FIN	2897	KAJAANI	64 17 N	27 40 E	132	1846	123	1903	N
5404	FIN	-9999	OULU	65 2 N	25 29 E	13	1846	123	1905	N
6801	FIN	2869	KUUSAMO	65 59 N	29 13 E	263	1908	123	1909	N
7501	FIN	2839	SODANKYLAE	67 22 N	26 39 E	179	1908	123	1908	N
4030	IS	4030	REYKJAVIK	64 8 N	21 54 W	52	1823	123	1949	
4013	IS	4013	STYKKISHOLMUR	65 5 N	22 44 W	8	1845	123	1949	
4063	IS	4063	AKUREYRI	65 41 N	18 5 W	23	1882	123	1949	
4092	IS	4092	TEIGARHORN	64 18 N	15 12 W	14	1872	123	1949	
4048	IS	4048	VESTMANNAEYAR	63 24 N	20 17 W	118	1877	123	1949	
6452	S	2640	VAEXJOE	56 52 N	14 48 E	166	1869	123	1885	N

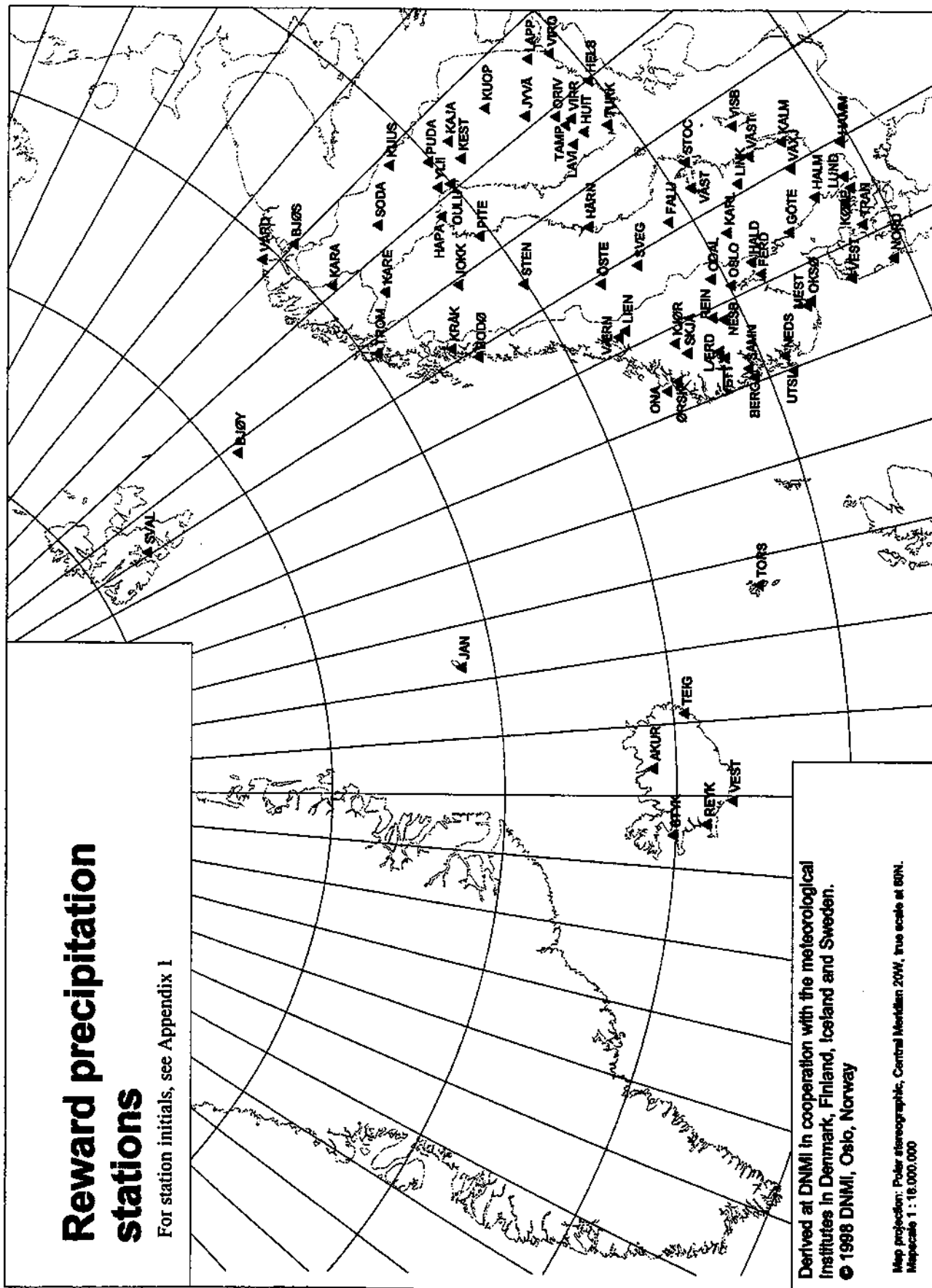
REWARD number	Ctry code	WMO number	STATION NAME	Lat.	Long.	Altitude m a.s.l.	Start	Element	Begin	Status
7147	S	2512	GOETEBORG	57 46 N	11 53 E	29	1869	123	1885	N
7647	S	-9999	VAESTERVIK	57 43 N	16 28 E	33	1885	123	1885	N
7840	S	2590	VISBY	57 40 N	18 20 E	42	1869	123	1885	N
9322	S	2418	KARLSTAD	59 21 N	13 28 E	46	1859	123	1885	N
9821	S	2485	STOCKHOLM	59 20 N	18 3 E	44	1756	123	1885	N
10537	S	2433	FALUN	60 37 N	15 37 E	169	1869	123	1885	N
12402	S	2324	SVEG	62 1 N	14 21 E	369	1875	123	1885	N
12738	S	-9999	HAERNOESAND	62 37 N	17 56 E	8	1859	123	1885	N
13411	S	2226	OESTERSUND	63 11 N	14 29 E	376	1869	123	1885	N
16395	S	2196	HAPARANDA	65 49 N	24 8 E	5	1869	123	1885	N
16988	S	2142	JOKKMOKK	66 37 N	19 38 E	269	1869	123	1885	N
19283	S	2080	KARESUANDO	68 26 N	22 29 E	327	1869	123	1885	N
15772	S	-9999	STENSELE	65 4 N	17 9 E	325	1861	123	1885	N
6193	DK	6193	HAMMERODDE FYR	55 18 N	14 47 E	11	1853	602	1890	
21100	DK	-9999	VESTERVIG	56 46 N	8 19 E	18	1873	602	1890	
25140	DK	-9999	NORDBY	55 26 N	8 24 E	5	1872	602	1890	
27080	DK	-9999	TRANEBJERG	55 51 N	10 36 E	11	1838	602	1890	
30380	DK	6186	KOEBENHAVN	55 41 N	12 32 E	9	1751	602	1890	
304	FIN	2978	HELSINKI	60 10 N	24 57 E	4	1829	602	1882	
1101	FIN	2972	TURKU	60 31 N	22 16 E	51	1873	602	1891	
1103	FIN	-9999	HUITTINEN	61 10 N	22 47 E	69	1894	602	1894	
1202	FIN	-9999	TAMPERE	61 28 N	23 45 E	85	1873	602	1891	
1601	FIN	-9999	VIROLAHTI	60 32 N	27 33 E	22	1894	602	1894	
1701	FIN	2958	LAPPEENRANTA	61 5 N	28 9 E	105	1886	602	1886	
2425	FIN	-9999	JYVAESKYLAE	62 12 N	25 43 E	137	1883	602	1891	
2104	FIN	-9999	LAVIA	61 37 N	22 33 E	60	1903	602	1903	
2211	FIN	-9999	VIRRAT	61 13 N	23 50 E	128	1909	602	1909	
2306	FIN	-9999	ORIVESI	61 33 N	24 32 E	89	1909	602	1909	
3602	FIN	-9999	KUOPIO	62 54 N	27 41 E	119	1846	602	1891	
4509	FIN	-9999	KESTILAE	64 21 N	26 17 E	95	1909	602	1909	
4601	FIN	2897	KAJAANI	64 17 N	27 40 E	132	1846	602	1886	
5404	FIN	-9999	OULU	65 2 N	25 29 E	13	1846	602	1891	
5407	FIN	-9999	YLI-I	65 22 N	25 51 E	45	1912	602	1912	
5605	FIN	-9999	PUDASJAERVI	65 6 N	27 32 E	220	1909	602	1909	
6801	FIN	2869	KUUSAMO	65 59 N	29 13 E	263	1908	602	1908	
7501	FIN	2839	SODANKYLAE	67 22 N	26 39 E	179	1908	602	1907	
6011	FR	6011	TORSHAVN	62 1 N	6 46 W	43	1873	602	1890	
4210	G	4210	UPERNAVIK	72 47 N	56 10 W	63	1873	602	1949	
4250	G	4250	NUUK	64 10 N	51 45 W	59	1866	602	1921	
4270	G	4270	NARSARSUAQ	61 12 N	48 10 W	39	1866	602	1890	
4320	G	4320	DANMARKSHAVN	76 46 N	18 46 W	11	1949	602	1949	
4339	G	4339	ITTOQQORTOOMIT	70 29 N	22 0 W	65	1924	602	1949	
4360	G	4360	TASILAQ	65 36 N	37 38 W	59	1895	602	1897	
4030	IS	4030	REYKJAVIK	64 8 N	21 54 W	52	1823	602	1924	
4013	IS	4013	STYKKISHOLMUR	65 5 N	22 44 W	8	1845	602	1890	
4063	IS	4063	AKUREYRI	65 41 N	18 5 W	23	1882	602	1925	
4092	IS	4092	TEIGARHORN	64 18 N	15 12 W	14	1872	602	1890	
4048	IS	4048	VESTMANNAEYAR	63 24 N	20 17 W	118	1877	602	1890	
1230	N	1230	HALDEN	59 7 N	11 23 E	8	1895	602	1895	H
5350	N	-9999	NORD-ODAL	60 23 N	11 33 E	147	1895	602	1895	H
15660	N	-9999	SKJAAK	61 54 N	8 10 E	432	1895	602	1896	H
16740	N	1235	KJOEREMSGRENDI	62 6 N	9 3 E	626	1864	602	1890	N
18700	N	1492	OSLO-BLINDERN	59 57 N	10 43 E	94	1837	602	1890	N
22840	N	-9999	REINLI	60 50 N	9 46 E	628	1895	602	1895	H
24880	N	1372	NESBYEN	60 34 N	9 7 E	167	1895	602	1897	N

REWARD number	Ctry code	WMO number	STATION NAME	Lat.	Long.	Altitude m a.s.l.	Start	Element	Begin	Status
27500	N	1482	FERDER FYR	59 2 N	10 32 E	6	1885	602	1890	N
39100	N	1448	OKSOEY FYR	58 4 N	8 3 E	9	1869	602	1890	N
39220	N	-9999	MESTAD	58 13 N	7 54 E	151	1900	602	1900	H
47020	N	-9999	NEDSTRAND	59 21 N	5 48 E	10	1895	602	1895	H
47300	N	1403	UTSIRA FYR	59 18 N	4 53 E	55	1867	602	1920	N
50350	N	-9999	SAMNANGER	60 28 N	5 54 E	370	1901	602	1901	H
50540	N	1317	BERGEN-FLORIDA	60 23 N	5 20 E	12	1861	602	1890	N
54130	N	1355	LAERDAL	61 4 N	7 31 E	36	1869	602	1890	N
54900	N	-9999	VETTI	61 0 N	7 1 E	329	1895	602	1895	N
60800	N	-9999	OERSKOG	62 29 N	6 49 E	4	1895	602	1895	T
62480	N	1212	ONA	62 52 N	6 32 E	13	1868	602	1919	N
68330	N	-9999	LIEN I SELBU	63 13 N	11 7 E	255	1895	602	1895	T
83500	N	-9999	KRAAKMO	67 48 N	15 59 E	76	1895	602	1895	T
90450	N	1026	TROMSOE	69 39 N	18 56 E	109	1867	602	1890	N
97250	N	1065	KARASJOK	69 28 N	25 31 E	129	1877	602	1890	H
98550	N	1098	VARDOE	70 22 N	31 5 E	14	1867	602	1893	N
99450	N	-9999	BJOERNSUND	69 27 N	30 4 E	28	1895	602	1895	H
99710	N	1028	BJOERNOEYA	74 31 N	19 1 E	16	1919	602	1926	I
99840	N	1008	SVALBARD AIRPORT	78 15 N	15 28 E	28	1911	602	1957	N
99950	N	1001	JAN MAYEN	70 56 N	8 40 W	19	1921	602	1922	I
5343	S	-9999	LUND	55 42 N	13 12 E		1885	602	1885	
6240	S	-9999	HALMSTAD	56 40 N	12 55 E	25	1885	602	1885	
6452	S	2640	VAEXJOE	56 52 N	14 48 E	166	1869	602	1873	
6641	S	2672	KALMAR	56 43 N	16 17 E	15	1885	602	1885	
7147	S	2512	GOETEBORG	57 46 N	11 53 E	29	1869	602	1881	
7647	S	2559	VAESTERVIK	57 43 N	16 28 E	33	1885	602	1885	
7840	S	2590	VISBY	57 40 N	18 20 E	42	1869	602	1879	
8524	S	2582	LINKOEPING	58 40 N	15 32 E	64	1885	602	1885	
9322	S	2418	KARLSTAD	59 21 N	13 28 E	46	1859	602	1881	
9635	S	2418	VAESTERAAS	59 35 N	16 37 E	6	1885	602	1885	
9821	S	2485	STOCKHOLM	59 20 N	18 3 E	44	1756	602	1873	
10537	S	2433	FALUN	60 37 N	15 37 E	169	1869	602	1875	
12402	S	2324	SVEG	62 1 N	14 21 E	360	1885	602	1885	
12738	S	-9999	HAERNOESAND	62 37 N	17 56 E	8	1859	602	1879	
13411	S	2226	OESTERSUND	63 11 N	14 29 E	376	1869	602	1875	
15772	S	-9999	STENSELE	65 4 N	17 9 E	325	1861	602	1885	
16179	S	-9999	PIEAAA	65 32 N	21 29 E	6	1885	602	1885	
16395	S	2196	HAPARANDA	65 49 N	24 8 E	5	1869	602	1873	
16988	S	2142	JOKKMOKK	66 37 N	19 38 E	269	1869	602	1882	
19283	S	2080	KARESUANDO	66 26 N	22 29 E	327	1885	602	1885	

Appendix 3 A, Location of temperature stations in the REWARD-dataset



Appendix 3 B, Location of precipitation stations in the REWARD-dataset



## **Appendix 4 National Data Advisers**

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## Appendix 5 Data exchange standard and Element codes

Copies of the REWARD Dataset can be ordered by contacting one of the national data advisers listed in Appendix 4.

The REWARD dataset consists of 7 ASCII files named by the element, rew111.dat, rew112.dat, etc., where each record contains data form one year in the following fixed format:

Position	Format	Description
1-5	I5	National station number = REWARD number (see appendix 2)
6-8	I3	Element number (see code below)
9-12	I4	Year
13-17	I5	January value (unit see below; no decimalpoints)
18-22	I5	February value do
23-27	I5	March value do
28-32	I5	April value do
33-37	I5	May value do
38-42	I5	June value do
43-47	I5	July value do
48-52	I5	August value do
53-57	I5	September value do
58-62	I5	October value do
63-67	I5	November value do
68-72	I5	December value do

Missing value: -9999

No blanks included, except leading blanks

No missing years between start and end of data series

### Code for element numbers

Number	Element	Unit	Abbreviation
111	mean maximum temperature	0.1 °C	Tx
112	highest maximum temperature	0.1 °C	Th
113	day of Th	date	Thd
121	mean minimum temperature	0.1 °C	Tn
122	lowest minimum temperature	0.1 °C	Tl
123	day of Tl	date	Tld
602	maximum 1-day precipitation	0.1 mm	Rx