Upper Air, surface and snow data deliverables contributed by RIHMI to WP3

By Alexander Sterin (RIHMI-WDC, Obninsk, Russia)

e-mail: sterin@meteo.ru

http://www.meteo.ru

With main contribution from: V. Veselov, D. Nikolaev, O.Bulygina, N. Korshunova, A. Lavrov, A. Khohlova and many others…

Upper-Air Data (content of effort):

A group of U/A stations (41 stations from Russia and from former fUSSR territory) was identified.

The time period covered is varying from station to station, the earliest is 1936, the latest is December 1960.

The data are disseminated in three sources:

- computer media (not all stations, poor vertical resolution - not all levels, few standard pressure levels only)
- handwritten tables
- computerized views of old punch-card formats (the handwritten tables previously in 1970s-1980s were manually keyed by punching machines to punch-cards and in late 1980s the paper punch-cards were copied to 9-track magnetic tapes in the mode "as-is")

The software for processing computerized views of old punch-cards included bit-by-bit decoding of punch-cards codes into digits, transformations of values, merging of data from different sources and merging of data from different level types into single soundings

Pre-QC based on statistics for the same station, but calculated for later period

QC based on statistical tables assessment plus statistical graphs

Compared the completeness of our data set with completeness of IGRA data set and with completeness of IGRA v2 Beta data set

Upper-Air Data (content of effort):

Total:

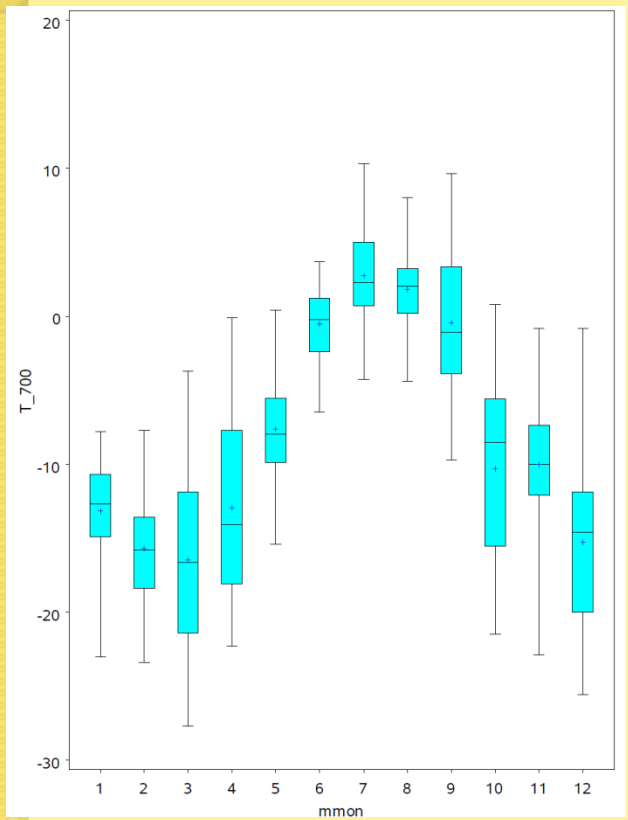
The amount of soundings: 390 873
The amount of levels: 8 993 028

The most of data are for 1950's, but some (few of them) are for 1940's and even for the 1930's

Within WP4, we compared how reanalyses ERA- 20C and 20CR reproduce temperatures values in the 1950's and back from these 41 stations

Will be reported in WP4 talk tomorrow

Pre-QC of U/A data: statistical tables plus statistical graphs

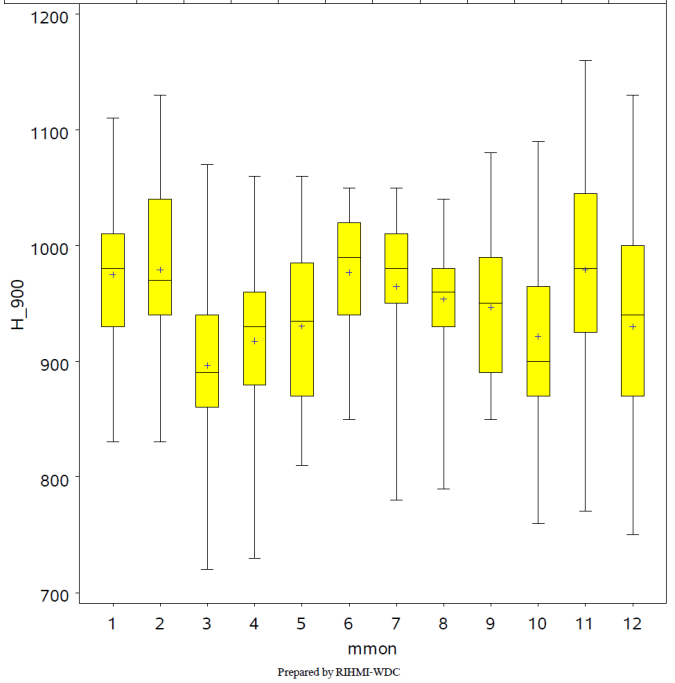


STATISTICS FOR F,T AND U ON STANDARD PRESSURE LEVELS FOR R CAO

STATISTICS FOR F,T AND U ON STANDARD PRESSURE LEVELS FOR BIG TABLES
STATISTICS FOR F YEAR=1945

Overall Statistics												
Min	720			Mean	947.6622			Max	1160		
Pooled Std Dev	71.58791											

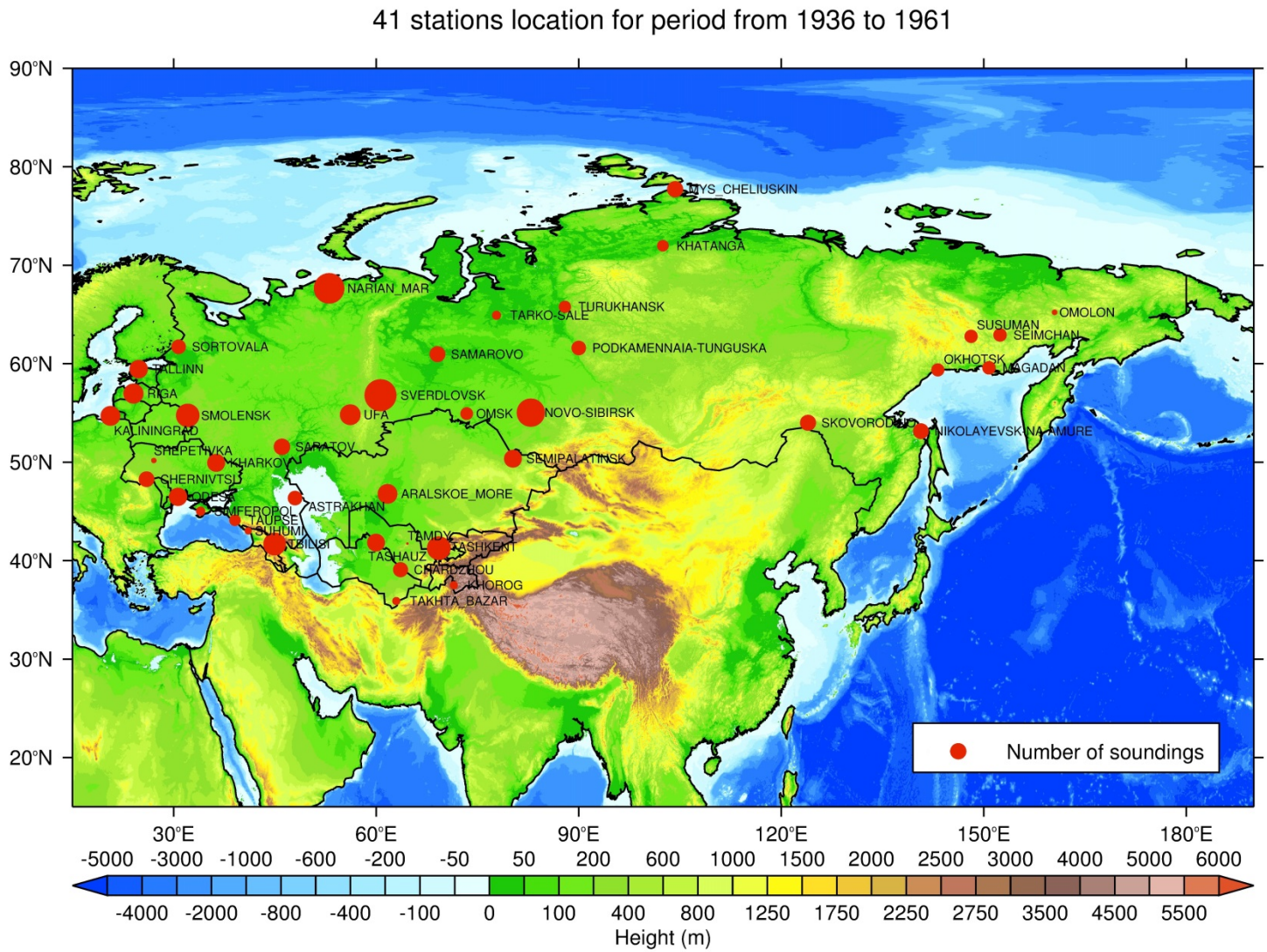
Extremes and means by month												
Min	830	830	720	730	810	850	780	790	850	760	770	750
Mean	974.898	979.0741	896.2903	917.6667	930.3125	976.6234	964.9254	953.8462	946.7241	921.6667	979.0625	929.8889
Max	1110	1130	1070	1060	1060	1050	1050	1040	1080	1090	1160	1130

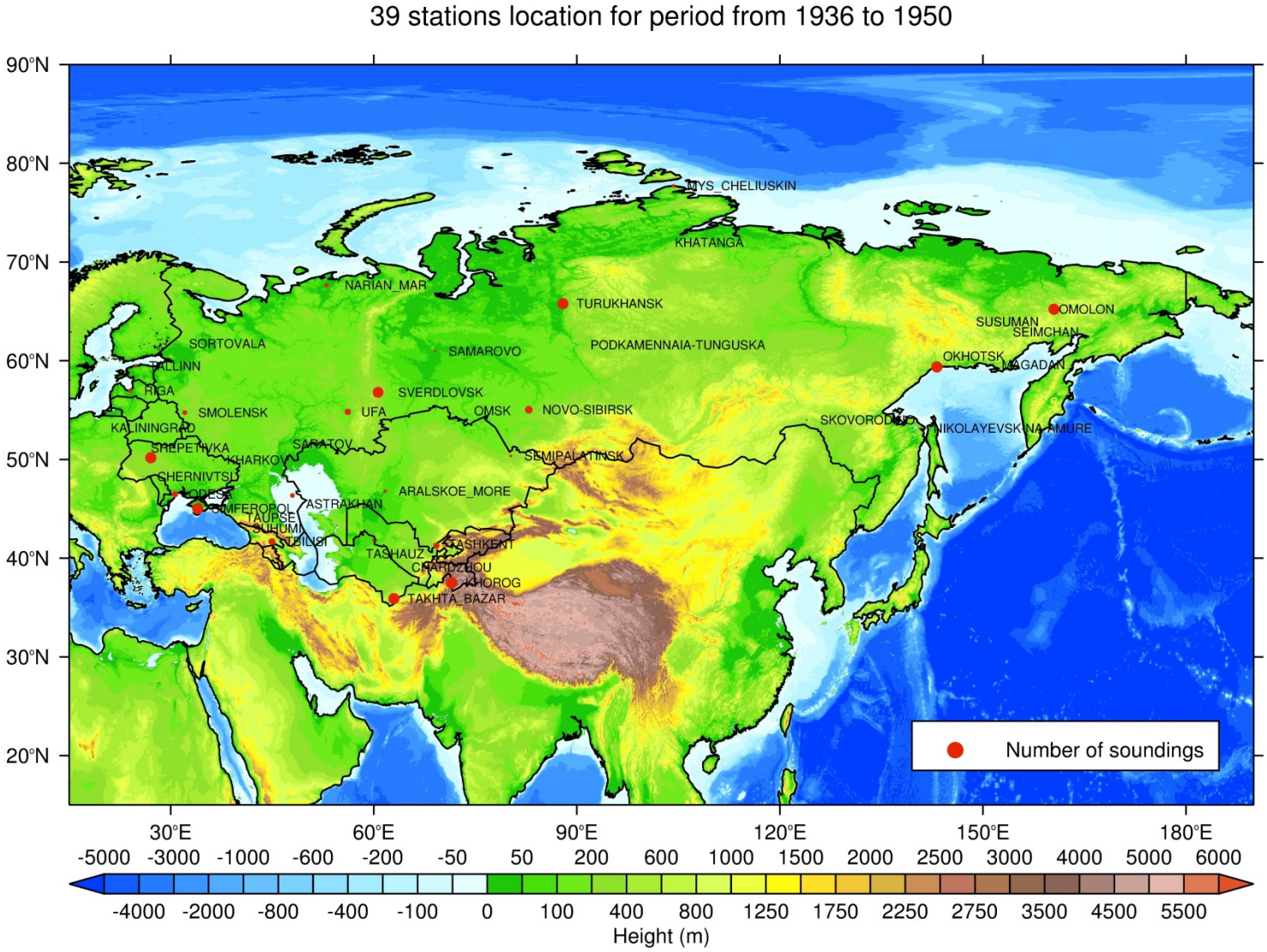


Prepared by RIHMI-WDC

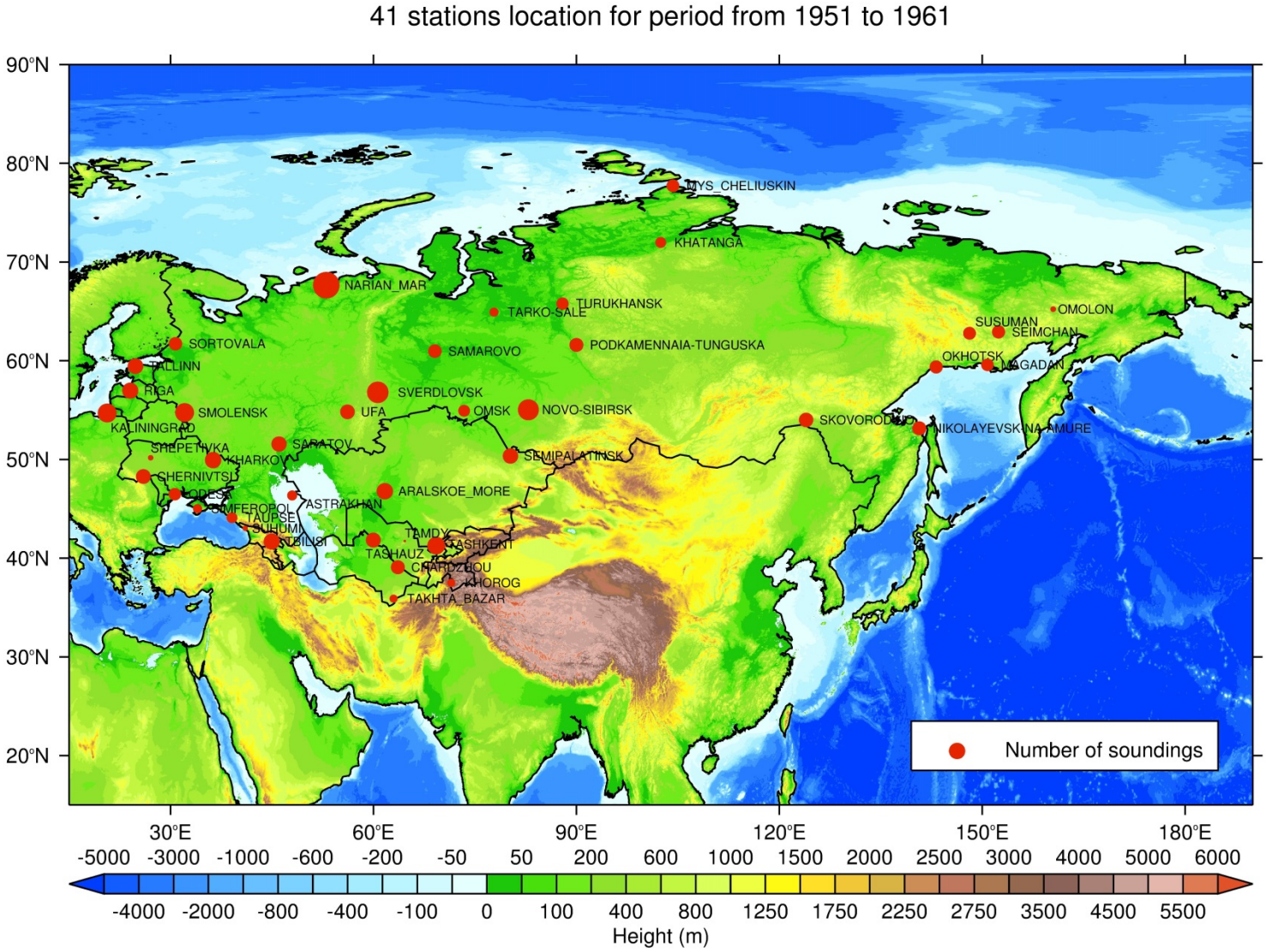
Feedback from statistical tables and statistical graphs to primary data sources

ВНИИГМИ-МЦД


41 stations location for period from 1936 to 1961
90°N
80°N
70°N
60°N
50°N
40°N
30°N
20°N
MYS_CHELIUSKIN
KHATANGA
NARIAN_MAR
TARKO-SALE
TURUKHANSK
OMOLON
SUSUMAN
SEIMCHAN
SORTOVALA
SAMAROVO
PODKAMENNAIA-TUNGUSKA
OKHOTSK
MAGADAN
TALLINN
RIGA
SVERDLOVSK
SMOLENSK
UFA
OMSK
NOVO-SIBIRSK
SKOVORODINO
NIKOLAYEVSK-NA-AMURE
KALININGRAD
SARATOV
SEMIPALATINSK
KHARKOV
CHERNIVTSI
ARALSKOE_MORE
ASTRAKHAN
SIMFEROPOL
TAUPSE
SUHUMI
TBILISI
TAMDY
TASHKENT
TASHAUZ
CHARDZHOU
KHOROG
TAKHTA_BAZAR
Number of soundings
30°E
60°E
90°E
120°E
150°E
180°E
-5000 -3000 -1000 -600 -200 -50 50 200 600 1000 1500 2000 2500 3000 4000 5000 6000
-4000 -2000 -800 -400 -100 0 100 400 800 1250 1750 2250 2750 3500 4500 5500
Height (m)



Few soundings were for sub-period 1936-1950, 39 of 41 stations



Most soundings were for sub-period 1951-1961, 41 of all 41 stations

Completeness: RIHMI vs IGRA and IGRA v2 beta for 1936-1960

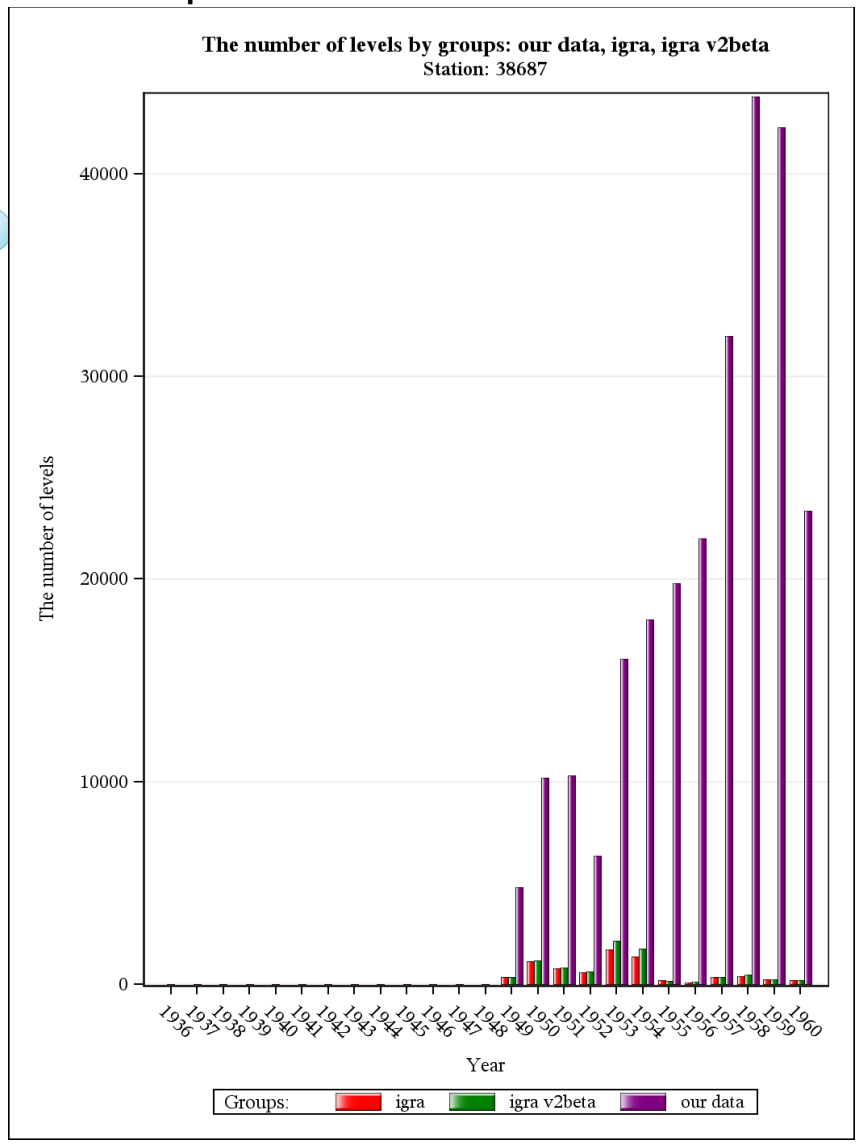


Fig. 1 The number of levels by year for the period 1936-1960 for station CHARDZOU (Middle Asia) in IGRA (red), IGRA V2BETA (green) and our rescued data (lilac)

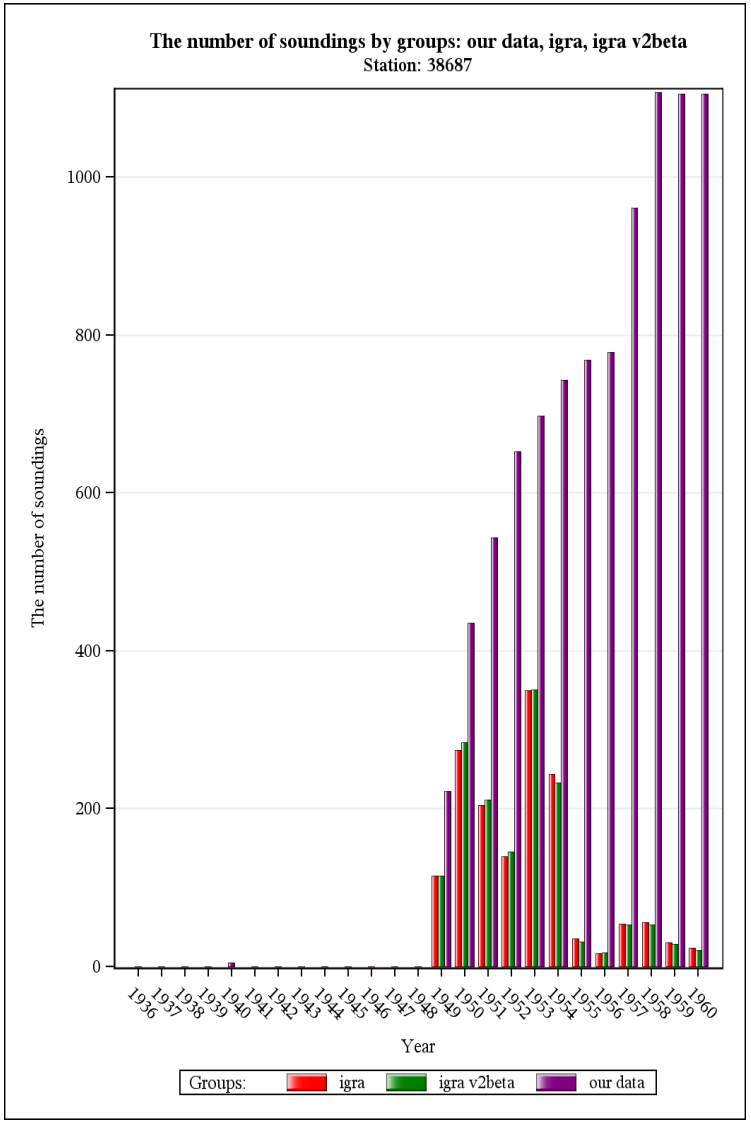


Fig.2. As on Fig.1, but for number of soundings

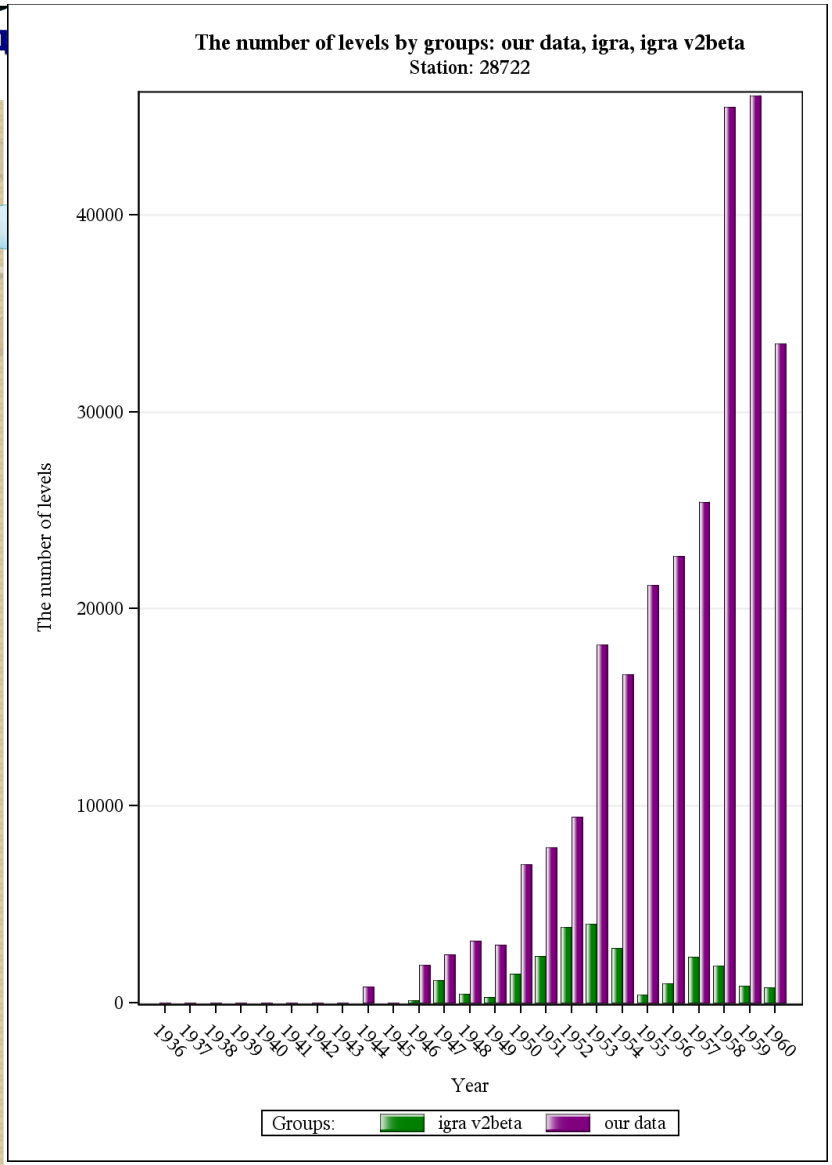


Fig.3 As on Fig.1 but for station 28722 (UFA), missing in IGRA (present in IGRA v2beta)

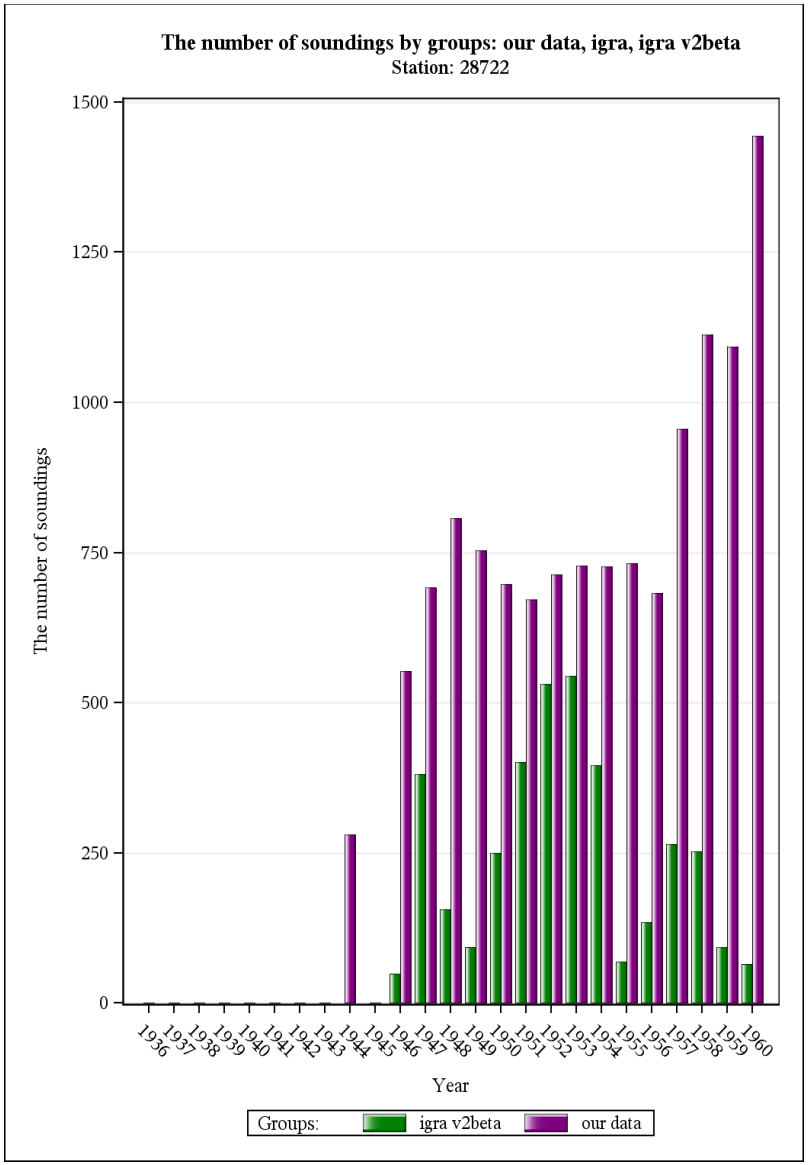


Fig.4 As on Fig.2 but for station 28722 (UFA), missing in IGRA

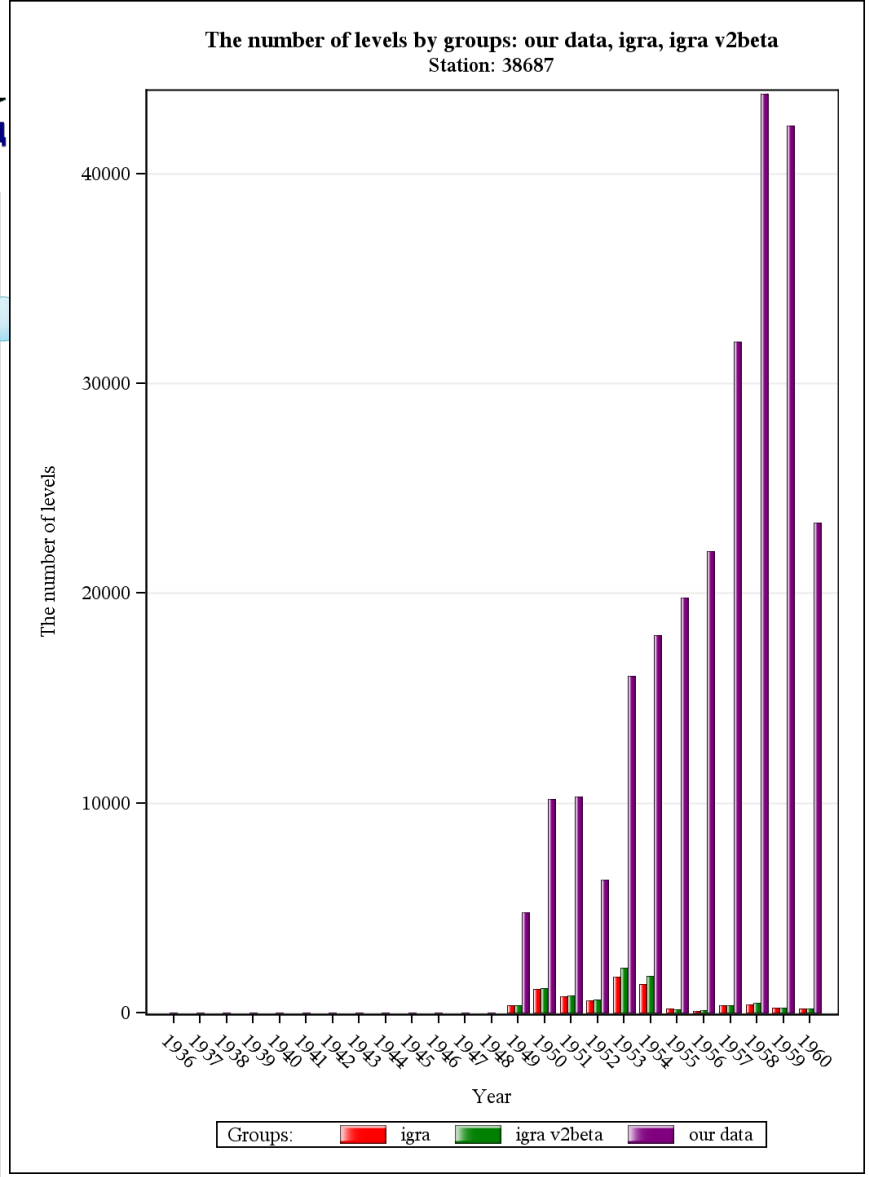


Fig.3 As on Fig.1 but for station 38687 (), missing in IGRA (present in IGRA & IGRA v2beta)

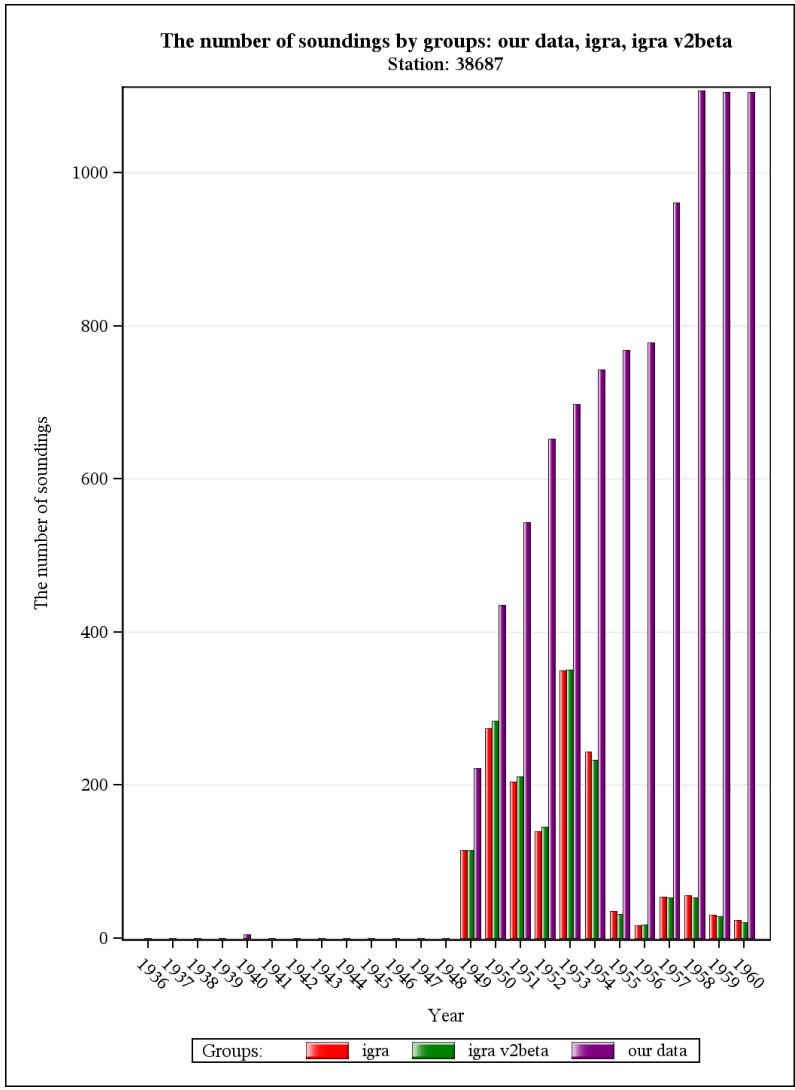


Fig.4 As on Fig.2 but for station 38687 (), present in IGRA

Surface meteorological sub-daily data: content of effort:

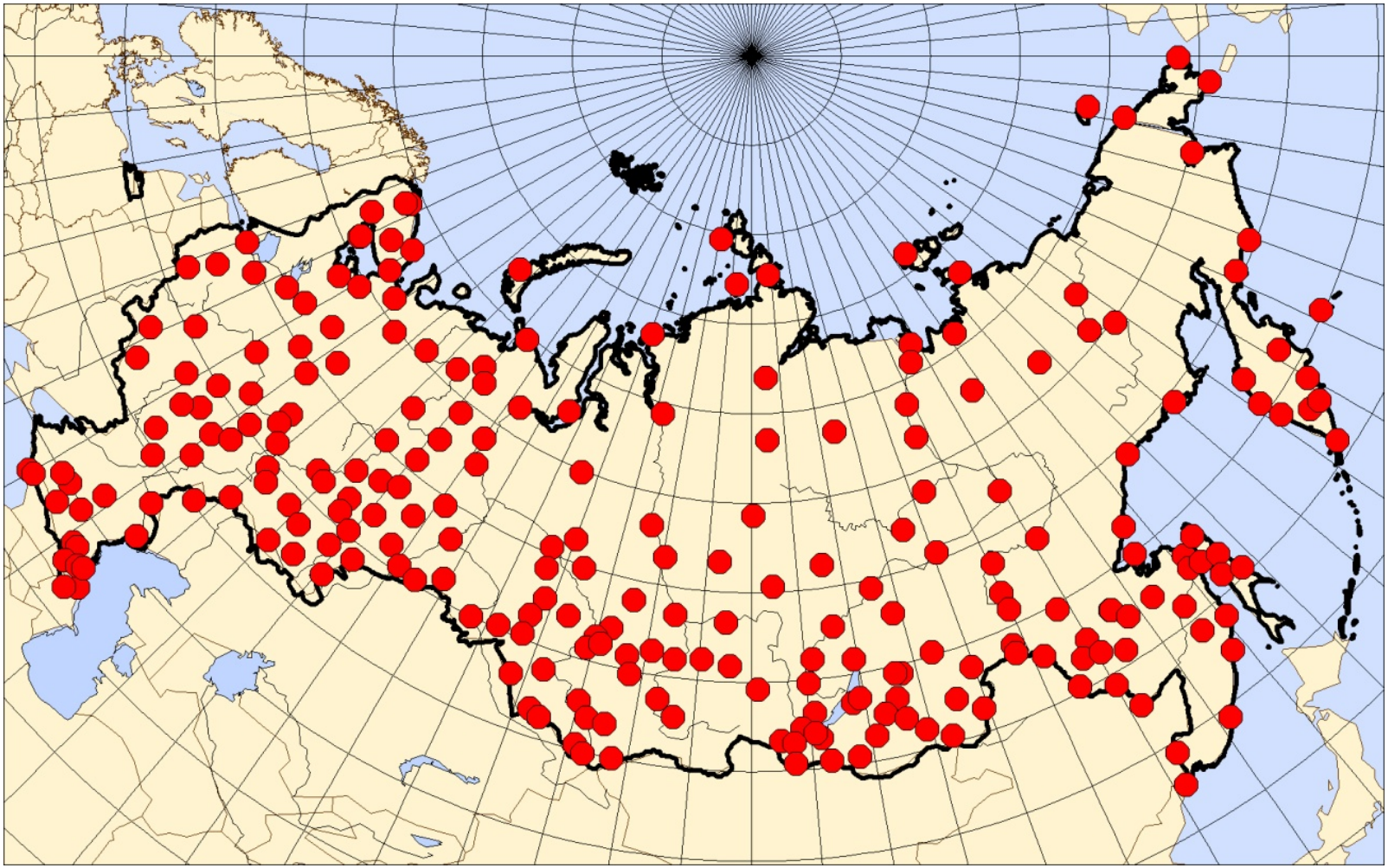
The goal within ERA CLIM2 Project was to extend part of stations data for period from the beginning of observation and ending by 1965 (provided for 4 observations per day). The subset of 246 stations of the 518 was eventually selected for this extension and data were prepared.

The following data operations were done for 246 stations to obtain the extension for 1965 and back:

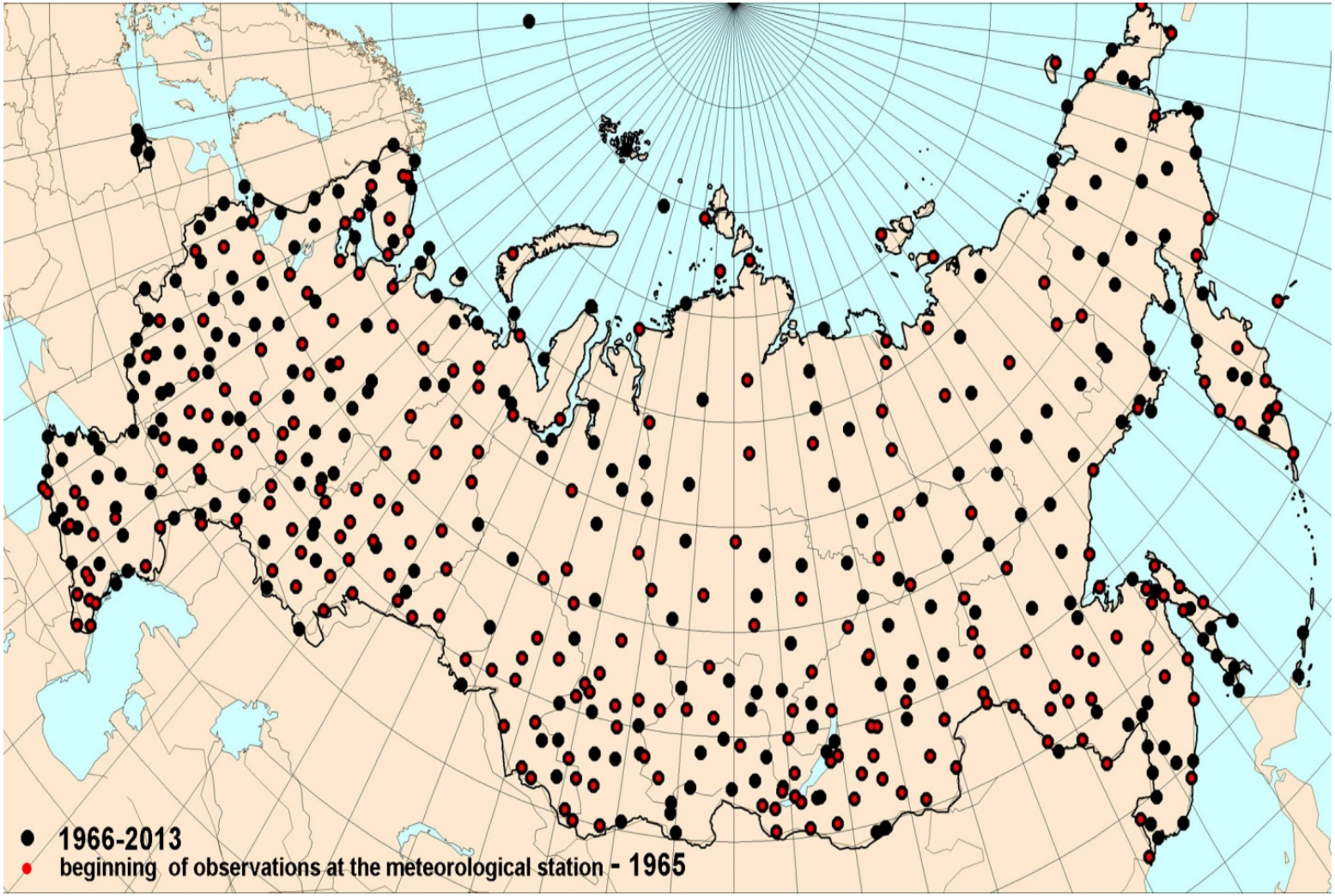
- The assessment of existing sources of data on computer media in odd old formats and in hardcopies, to select subset of stations acceptable for period extension
- The reformatting of old odd formatted data, to fit the common format for 1966 and later data set.
- Filling gaps in data for period before 1966 by digitizing hardcopy materials, transforming digitized data to common format
- Operations with date and time variables, setting Greenwich date-time
- QC of data (details of QC are contained in data set description document)

Map of stations containing sub-daily meteorological observation for 1965 and back till the beginning of observations*

** For most of 246 stations, period begins in middle 1930s*



Red dot inside black circle – time series are extended back and cover period from the beginning of observations



Snow data for territory of Russia: content of effort

To create (mainly based on manual digitizing and on data management and check) data set of daily snow cover observations. These daily snow cover observations at meteorological stations include snow depth measurements and determination of the snow cover extent over the near-station territory and the character (type) of snow cover

The following data operations were done for snow data for 20 stations to obtain the extension of station list:

- Manual digitizing of materials that were not available on computer media
- Reformatting of old odd formatted data from different computer media sources
- Merging the data from different sources into single common format
- QC and flagging values

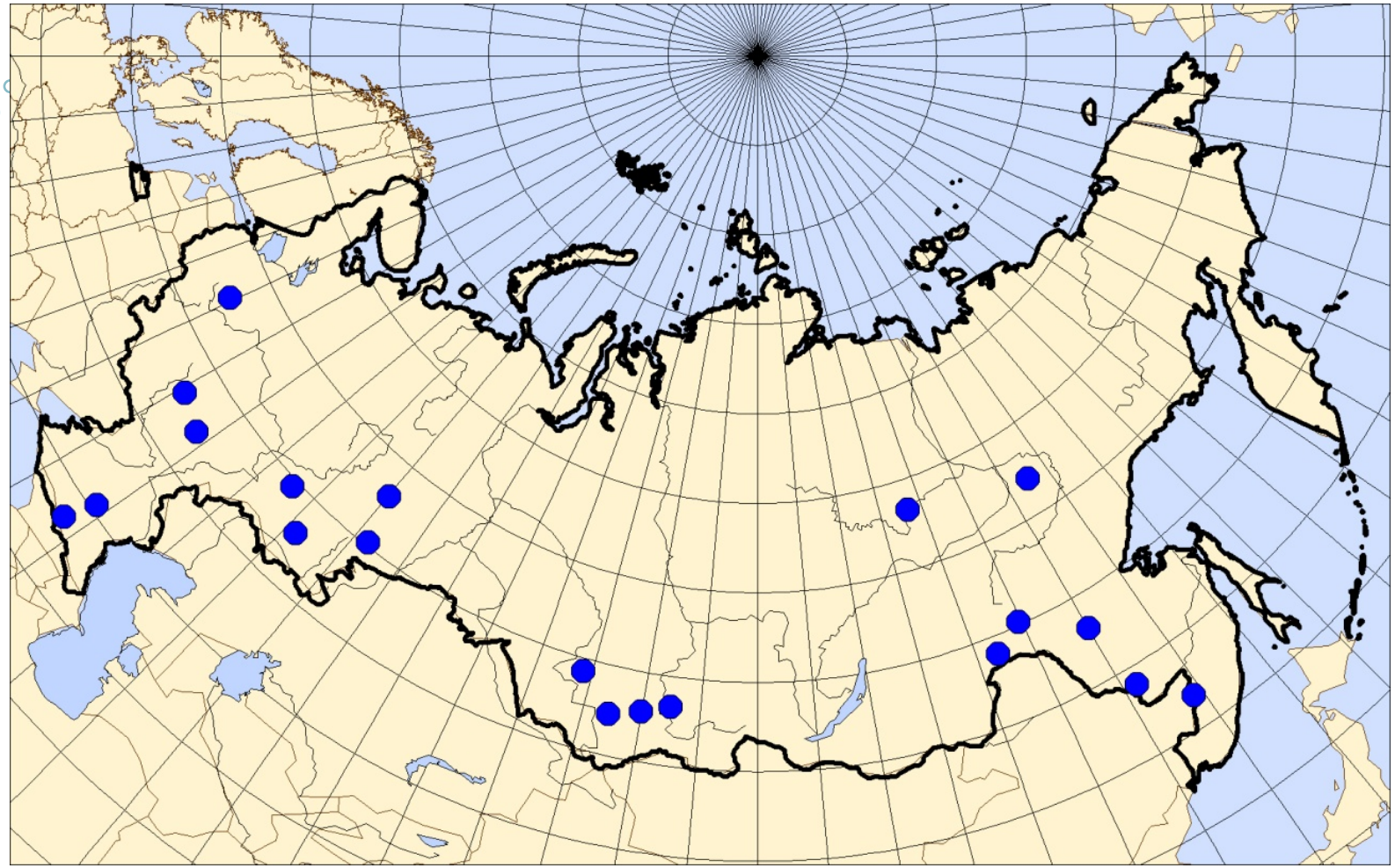
http://meteo.ru/english/climate/snow.php

SITUATION	FLAG
Value of snow depth is correct	0
Continuous snow melting	1
Snow cover absent at site, however there is snow in the neighbor vicinity and a state of it is specified.	2
Snow cover is less than 0.5 cm	3
Observations were not made or value is rejected	9

№	Index WMO	Name	Latitude	Longitude	Beginning year	End year
1	24639	NJURBA	63º17’	118º20’	1936	2014
2	24768	CURAPCA	62 º 02’	132 º 36’	1936	2014
3	26393	VYSNIJ VOLOCEK	57 º 32’	34 º 33’	1893	2014
4	27935	MICURINSK	52 º 53’	40 º 29’	1927	2014
5	28240	NIZHNYJ TAGIL	57 º 53’	60 º 04’	1936	2014
6	28645	CHELJABINSK	55 º 09’	61 º 18’	1900	2014
7	28711	BUGUL’MA	54 º 38’	52 º 48’	1932	2014
8	28925	MELEUZ	52 º 57’	55 º 58’	1936	2014
9	29736	MASLJANINO	54 º 20’	84 º 13’	1937	2014
10	29869	ERMAKOVSKOE	53 º 18’	92 º 25’	1936	2014
11	29956	TASTYP	52 º 48’	89 º 53’	1936	2014
12	30499	TYNDA	55 º 11’	124 º 40’	1936	2014
13	30683	EROFEJ PAVLOVIC	53 º 58’	121 º 56’	1936	2014
14	31318	NORA	53 º 21’	130 º 00’	1936	2014

ВНИИГМИ-МЦД

Map of stations with rescued snow cover data



Thank you for attention!

ВНИИГМИ-МЦД

The contents and format of data set of snow cover characteristics for stations site observations

Field number	Field contents	Notes
1	WMO index of station	
2	Year	
3	Month	
4	Day	
5	Snow depth	In cm
6	Extent of snow cover around the station	In numbers on ten-number scale, see Table 2 on next slides
7	Q- Complementary flag of snow depth	See Table 3 on next slides

Table 2

Extent of snow cover around the station

Observation period	Extent of snow cover around the station	Value Q
Before July 1959	50% and less than 50% of the area around the station	0
	More than 50% of the area around the station	1
From August 1959 up to the present day	Extent of snow cover around the station is estimated from ten-number scale. For example, the lack of snow is 0, 20% of the area around the station covered with snow is 2, 50% of the area around the station covered with snow is 5, etc.	From 0 to 10