RIHMI contribution to ERA-CLIM2 WP4

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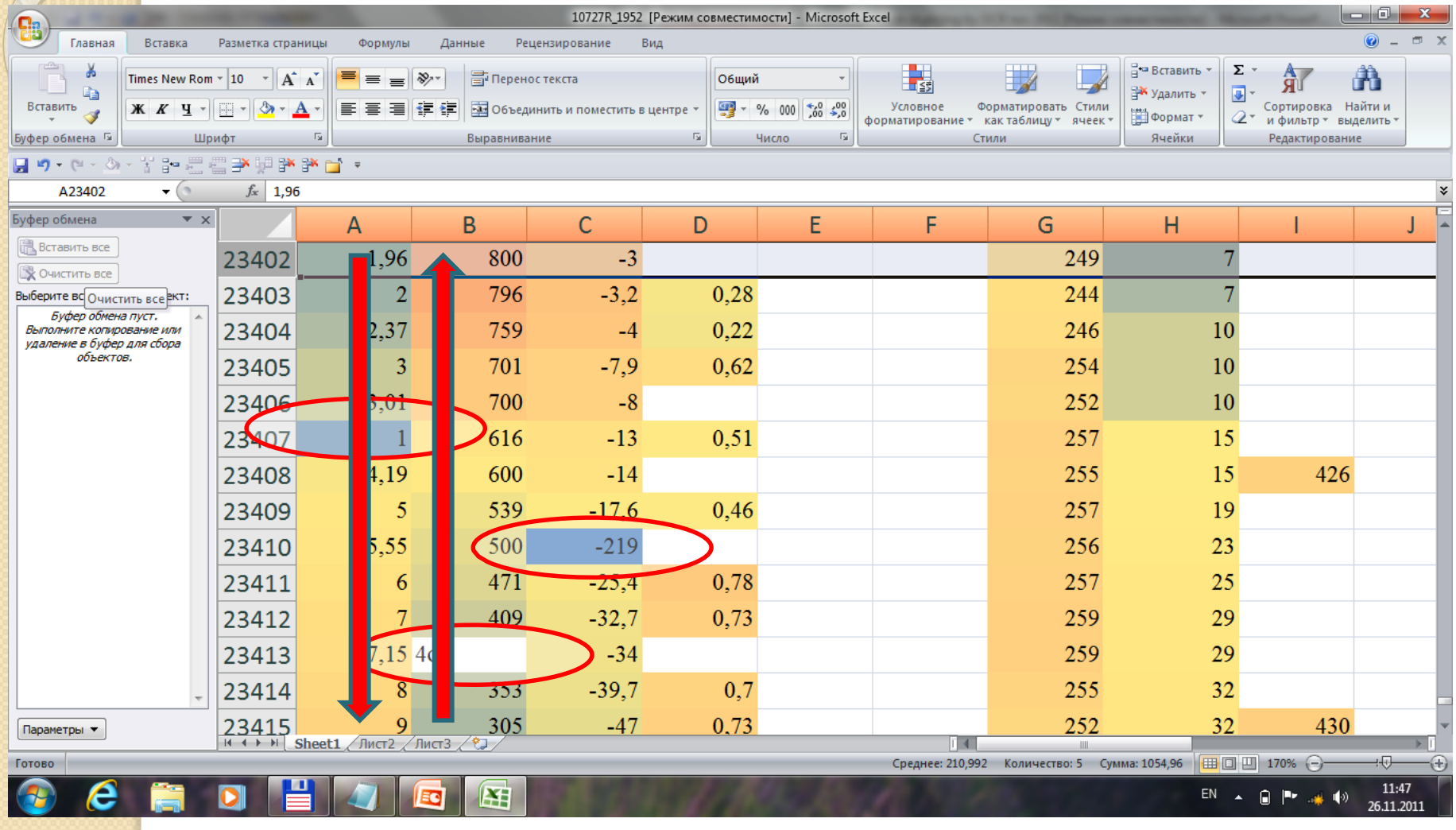
WP4 - Quantifying and reducing uncertainties [Months: 1-36]

T4.1 - Quality control, bias adjustment and homogenisation of input observations [Months: 1-36]
RIHMI: Improved QC for upper-air, surface, and snow observations

In ALL QC efforts, correct time of observation processing is vital!!!

STEPS OF THE TECHNOLOGY: PRE-QC OF DATA – CONDITIONAL FORMATTING ENABLES TO DETECT TYPICAL ERRORS



STEPS OF THE TECHNOLOGY: GENERAL PROCESS FOR MANUAL DIGITIZING

CONSTUCTING TABLE IN MS ACCESS AND MANUAL DIGITIZING

MS ACCESS TABLE OF DATA

IMPORT of MDB TABLE to SAS

PROCESSING BY SAS
- Data variables transformed and generated if needed

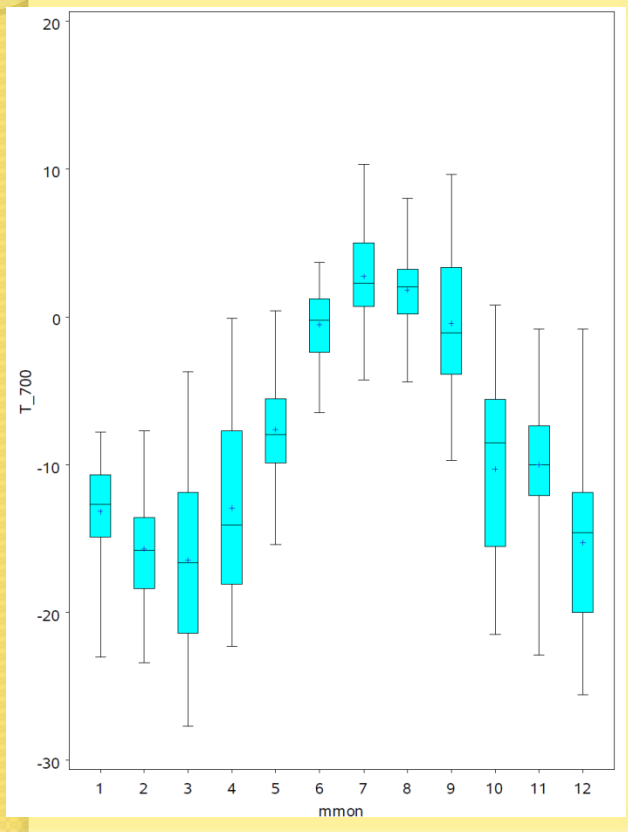
PROCESSING BY SAS
- **Data management operations**

PROCESSING BY SAS
- **Tables of statistics and statistical graphs (boxplots)**

PROCESSING BY SAS:OUTPUT OF DATA TO TXT FORMAT

Export of tables to ORACLE

Pre-QC of U/A data



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

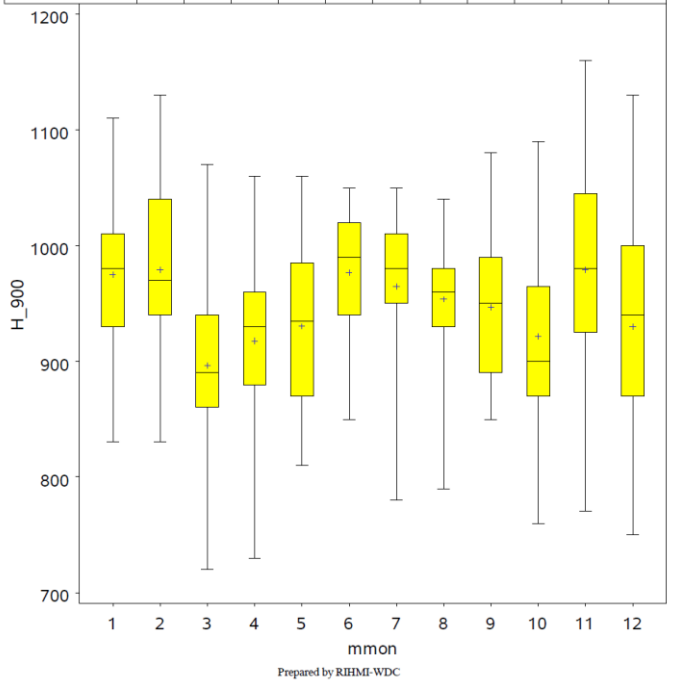
STATISTICS FOR F,T AND U ON STANDARD PRESSURE LEVELS FOR BIG TABLES
STATISTICS FOR F YEAR=1945

Overall Statistics

Min	720	Mean	947.6622	Max	1160
Pooled Std Dev	71.58791				

Extremes and means by month

	1	2	3	4	5	6	7	8	9	10	11	12
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

The contents and format of data set of snow cover characteristics for stations
We plan to retain the existing QC flags ideology for all additional data

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

Table 3

Complementary flag of snow depth (is constructed together with other meteorological data (T, P, Q, data at neighbour times and stations)

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

The format of data set of snow cover state characteristics

N	Field contents
1	Index WMO
2	Latitude
3	Longitude
4	Year
5	Month
6	Day
7	Route (Path) type 1 - field environment; 2 - forest environment; 3 – ravine (canions)
8	Extent of snow cover over route surroundings (0 -10)
9	Extent of snow cover along a route (0-10)
10	Extent of crust along a route (0-10)

N	Field contents
11	Snow cover depth average (sm)
12	Snow cover depth maximum (sm)
13	Snow cover depth minimum (sm)
14	Snow density (g/sm^A3)
15	Thickness of crust layer (mm)
16	Thickness of water-inundated snow cover (sm)
17	Thickness of pure water (sm)
18	Water equivalent of snow cover (mm)
19	General water amount (mm)
20	Snow covering type
21	Snow cover type

The data set contains data for 1966 - 2013.

WP4 - Quantifying and reducing uncertainties [Months: 1-36]

T4.2 - Diagnostics and uncertainty assessments of reanalysis output [Months: 1-36]
RIHMI: Assessments of reanalysis uncertainty for upper-air temperature and humidity against radiosondes at selected station locations

Use ERA-20C U/A T and Q, stations selections over the territory of Russia:
Station data selections for period of 2000's – well checked, have alternative sources, etc.
Station data selections from data prepared for ERA CLIM and ERA CLIM2 (late 40's – early 50s)

Thank you for attention!