

## Activities of CBS Lead Centre for GCOS for the WMO RA VI in the year 2020

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### 1. Evaluation of availability, completeness and correctness of CLIMAT reports

On a routine basis, DWD applies a near real-time quality control regarding availability and correctness of CLIMAT reports. This refers to all CLIMAT stations included in the GCOS Surface Network (GSN), the Regional Basic Climatological Network (RBCN) and the Antarctic Observing Network (AntON). TAC format is checked as well as BUFR format, if TAC is not available. The results of the quality control are the basis for various monitoring products.

DWD continued to increase the availability of CLIMAT data:

- by ingesting CLIMAT reports into the GTS received via e-mail from NMHS that are not or not well connected,
- by pointing NMHS to missing CLIMAT reports in the course of a month,
- by informing in case of receiving an incorrect month,
- by informing about severe errors in the reports,
- by distributing the monthly monitoring results to the CBS Lead Centres and the GCOS Network Manager. They contain information about missing GSN stations and format problems of CLIMAT reports received by the 20th of a month.

DWD informed the concerned NMHS directly by addressing the respective national focal points. Alternatively, the relevant CBS Lead Centre is approached with the request to contact the NMHS in charge.

Most errors belonged to the following categories:

- no or incorrect month-year-group. For example, 6-hourly receipt of bulletins with messages from several African countries every month. Around the 10th the month-year-groups of these bulletins turn into future.
- other errors in section 0 of TAC messages (incorrect spelling of code name CLIMAT, other invalid characters),
- invalid text/characters within the other sections,
- format errors (e.g. too short/too long groups, usage of “-“ for negative temperature values),
- content errors (e.g. extreme temperature values instead of mean values, tenths instead of whole numbers),
- correct month-year-indicator, but data from a different month. For example, Senegal disseminated data from March 2020 in the bulletin for July 2020.

The NMHS of more than 40 countries were contacted in 2020 by the CBS LC with the request to send or rectify their CLIMAT reports.

The COVID-19 pandemic had some impact on the dissemination of CLIMAT reports especially in spring and summer 2020. The number of stations sending messages was significantly reduced or zero from the following countries: Bolivia, Jordan, Peru and Sudan. The number of messages from Brazil and Mongolia also decreased. The missing reports were not submitted subsequently.

In the past there had been some ambiguities concerning the GSN station list, e.g. due to station changes. With support of the GSN network manager they could be resolved.

### *1.1. Availability and correctness of GSN Stations in the RA VI*

The GSN stations list of 2020 included 138 stations in RA VI. The annual average of received stations was 88 %.

Silent GSN stations in RA VI are:

- Iceland: 04048 Vestmannaeyjar reported up to April 2013. Its current status in OSCAR/Surface is closed.
- Portugal: 08506 Horta since February 2008
- Spain: 08181 Barcelona since October 2015
- Macedonia: 13577 Lazaropole since January 2014
- Albania: 13615 Tirana since September 2010
- Cyprus: 17600 Paphos
- Greece: 16734 Methoni since November 2012
- Russian Fed. 26359 Puskinskiy Gory since August 2018  
34927 Krasnodar-Kruglik since July 2017
- Syria: 40001 Kamishli since October 2012  
40022 Latakia since November 2013  
40061 Palmyra since November 2013
- Jordan: 40250 H-4 Rwashad since March 2020. Traditional weather station was closed in June 2018, since then AWS, also closed now. Efforts to reopen the AWS.

### *1.2. Availability of CLIMAT stations in BUFR*

In 2020 there were still countries, e.g. the Russian Federation, Greece, Finland, which didn't provide CLIMAT reports in BUFR format. Most of the RA VI countries provide CLIMATs in BUFR as well as in TAC. The BUFR CLIMATs of Norway and Sweden are transformed to TAC and re-ingested into the GTS by an unknown centre. These erroneous TACs are detected by the quality control every month. Since DWD receives them from the Washington hub, NCEI has started to investigate the source of the files. However, the original BUFR CLIMATs received from Norway and Sweden are correct.

### *1.3. Comparison of the receipt of GSN stations at JMA/DWD and NCEI*

JMA, NCEI and DWD continued evaluating the receipt status of GSN stations. This fulfilment of an action item from the 2016 GCOS Lead Centres Meeting bases on JMA's monthly GSNdiffer lists. They include GSN stations, which were only received by either DWD or JMA and those, which were missing by both.

The category of not received stations comprises also GSN stations reporting with an incorrect or missing month-year indicator. Other format errors prohibiting a correct automatic storage of the CLIMAT report are included as well.

### *1.4. Comparison of CLIMATs in TAC and BUFR*

In 2020 the comparison of the contents of CLIMAT messages from countries sending reports in TAC and BUFR format could not be continued. DWD intends to restart this activity in 2021.

## *2. Availability of GUAN Stations*

The number of GUAN stations in RA VI remained at 24 and all stations worked. The basis for the following information are the GUAN summaries from NCEP (<https://www1.ncdc.noaa.gov/pub/data/gcos/>) for observation reports in TAC format and the WMO WDAQMS monitoring ([https://wdqms.wmo.int/gcos/land\\_upper-air](https://wdqms.wmo.int/gcos/land_upper-air)) for GUAN stations reporting BUFR.

Some stations have ceased or partially ceased their TAC GTS transmission. In 2020 station 06610 Payerne (Switzerland), 11035 Wien/Hohe Warte (Austria) and 17607 Athalassa (Cyprus) did not report in TAC format. 01001 Jan Mayen (Norway) and 02836 Sodankyla (Finland) ceased their TAC transmission in the course of the year. Station 33345 Kiev (Ukraine) did not report BUFR at all as the only in RA VI.

The NCEP GUAN summaries showed that most stations performed soundings at 00 and 12 UTC regarding TAC. The yearly totals reached from approx. 700 to 1000 observations per station. More soundings (ca. 1400) were reported by station 10393 Lindenberg (Germany), less soundings (ca. 400) by station 33345 Kiev. 37789 Yerevan (Armenia) and 40265 Mafrag (Jordan) reported only a small number of observations. Nearly all soundings reached 10 hPa and above.

## *3. Collection of World Weather Records*

Following EC-64, Res. 14, DWD's CBS Lead Centre for GCOS supported the WMO Secretariat in collecting the World Weather Records (WWR) for RA VI. After the collection of WWR 2018 had been postponed by the WMO Secretariat a joint collection of World Weather Records 2018 and 2019 was performed in 2020.

WWR for 2018/2019 were received from 22/20 countries which approximates a rate of 50 % for RA VI. 11 countries provided also the WWR for previous years, Greece sent only the data for 2001-2010.

The format of the ASCII/Excel files was checked. Almost 70 % of the first data supplies did not comply with the specifications of the new templates, but in most cases corrections were made upon request, sometimes with support by the Lead Centre. The WWR files that meet the requirements were forwarded to NCEI.

#### *4. Update of the GSN Monitoring Products*

The redesigned GSNMC website [www.gsnmc.dwd.de](http://www.gsnmc.dwd.de) was published in March 2020. DWD sponsored the redesign of the webpage and coordinated the product implementation. The webpage is now integrated in the [gcos.de](http://gcos.de) domain, which is also hosted by DWD. The scope of available monitoring products has been extended following decisions of the AOPC, requirements of the WIGOS Data Quality Monitoring System (WDQMS) and further requirements that have emerged since the original implementation of the GSNMC. The product presentation has been modernized and offers now interactive maps and charts as well as additional information like metadata of the stations.

#### *5. Data and Statistics Requests*

At the request of Stefan Roesner (DWD, German GCOS coordinator) a summary about the availability of CLIMAT reports from GSN and RBCN stations in Senegal was prepared. Background was a question of the German body for international cooperation (GIZ) that considered funding the establishment of further weather stations in the country.

Météo-France and the Finish Meteorological Institut (FMI) worked with the Algerian Meteorological Service (ONM) in order to enhance their capacity in climate activities. Upon request of Denis Stuber (Météo-France, co-lead ET-DRC from SERCOM) comprehensive statistics about completeness and quality of Algerian CLIMAT messages for different time periods were generated.

The ET-DRC (Denis Stuber) requested a statistics about the dissemination of climatological standard normals periods within the CLIMAT reports. Therefore, the messages of the data month October 2020 were analysed and the results were summarised.

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