

Near Real-Time Updates

Breakout #4

Jay Lawrimore¹, Stephan Bojinski², Chris Little³, Matthew Menne¹, Scott Woodruff⁴, Albert Klein Tank⁵

¹NOAA NCDC, Asheville NC, USA

²WMO, Geneva, Switzerland

³Met Office, Exeter, UK

⁴NOAA ESRL, Boulder CO, USA

⁵KNMI, De Bilt, the Netherlands

Overview

- The Global Telecommunication System and its Limitations
- Monthly, Daily, and Sub-daily data
- Deficiencies in Transmission of Daily Data
- The WIS
- Recommendations

The GTS

- The exchange of data and information is made possible by the Global Telecommunication System (GTS)
 - A wide-area network that has connected WMO Members for more than four decades
 - It has largely met the needs of the climate community for high quality low-time-resolution (i.e., monthly) land station data
 - System has not kept pace with the need for daily and sub-daily land surface data over past 20 years
 - Very limited associated metadata, and insufficient quality, consistency, and completeness required by the climate community.

Data Types

- Types of observational data transmitted over the GTS
 - Surface instantaneous (short-period, e.g., 10 minute)
 - Climatological Data (monthly summaries, daily to some extent)
 - Other: Upper air observations, selected satellite data, seismic, tsunami, subsurface oceanographic
- Surface temperature data transmitted in climatological levels
 - CLIMAT and CLIMAT SHIP messages contain monthly summaries of max/min/mean temperature from land and ocean weather stations

Monthly, Daily, and Sub-daily

- Land Surface temperature data on monthly timescale
 - CLIMAT messages contain monthly summaries of max/min/mean temperature from land stations
 - WMO agreements for CLIMAT transmission from more than 200 countries for 2924 stations that are part of Regional Basic Climatological Network
 - 1025 comprise GCOS Surface Network (lengthly and reliable records)
- Daily and sub-daily timescale
 - GTS via Synoptic Bulletins and METAR/SPECI reports
 - 4404 stations comprise Regional Basic Synoptic Network
 - Many of these stations do not provide daily climate summaries
- In the marine community, higher-resolution data are generally used to assemble climatological data

Limitations of the GTS

- GTS has proven to be well designed and reliable
- Its effectiveness is limited by factors external to its technical design
 - Detailed catalogues of metadata (station lists) and distribution catalogues (routing tables) required
 - Necessary updates often not made in practice – resulting in errors of transmission and often much time to track and correct
 - Nations sometimes lack human or technical resources to provide observations on a routine or reliable basis
 - Even the largest and most developed sometimes have problems with formatting and transmission

Deficiencies in Daily Data

- There is no analog to CLIMAT bulletins on the daily timescale. No requirement for countries to report daily climate observations.
 - Daily data not routinely shared and no central repository
 - A “climatological data” code group in synoptic bulletins
- Daily observations from synoptic bulletins historically incomplete
- No international program for monitoring transmission or receipt, identifying errors, or facilitating corrections as there is for monthly reports

Deficiencies in Daily Data

- There are often inconsistencies between synoptic transmitted daily summaries and historical daily data
 - Differences in 24-hour reporting periods
 - Midnight UTC in synoptic/Midnight local historical climate
- Greater perceived commercial value of Daily and Sub-daily data
 - Willingness to exchange data not as great as for monthly
- Climate change conclusions suffer from lack of lengthy and complete daily data

Other Data Sharing Arrangements

- Some NMCs have established bilateral data sharing agreements with other NMCs to facilitate the collection of daily climate observations
 - Are most beneficial when they include the transfer of full historical data sets and arrangements for ongoing updates.
- A 2008 letter by the WMO Secretary-General called upon all WMO member nations to enhance the routine provision of daily and sub-daily data for climate purposes to the WDC-Asheville at NCDC
 - As a consequence, and as part of efforts to develop and maintain the Global Historical Climatology Network-Daily dataset, the GCOS Archive Center at NOAA NCDC now receives ongoing updates of daily data from six other WMO Members (Iran, Estonia, Uzbekistan, Cyprus, Canada, and Australia).
- This is a model that could work to improve access to data from other countries in the future.

Improved Technology: WMO Information System (WIS)

- Today's data sharing requirements require a system that is more service-oriented than the GTS
- Focus shifts from solely moving data (GTS) to managing data and information using new technologies
 - To make data and information easier to find and access
 - Users can make ad hoc requests for data through portals
 - (Search, request, view, and analyze archived data catalogued in WIS)
- Not the answer to all problems with current system
 - NMHSs still required to make distribution and exchange of information a top priority
 - To dedicate resources to identifying and resolving problems
 - To improving the overall quality and quantity of data

Recommendations

- Establish a formal mechanism for dissemination of daily climate messages or requirement for transmission of daily climate observations with synoptic reports
- Consider as a secondary priority the feasibility (including data exchange policy issues) of adoption of international mechanisms to standardize the exchange of the highest resolution data.
- Establish efforts at the WMO regional level to expand bilateral arrangements for sharing of daily and sub-daily data to increase data holdings and foster regular updates of global and regional daily data sets

Recommendations cont.

- Expand training opportunities at the regional and national level to improve the routine and regular dissemination of CLIMAT bulletins from developing nations.
- Continue to support Monitoring of quality and completeness of CLIMAT transmissions and feedback to data providers. Work to garner commitments for enhanced monitoring and feedback related to synoptic bulletins and daily climate summaries.
- Support adoption of WIS technologies and encourage establishment of GISCs and DCPCs.
- Encourage and support NMCs conversion of data transmissions to TDCFs, while at the same time ensuring adequate attention to issues of long-term data homogeneity in support of climate research



Thank You!