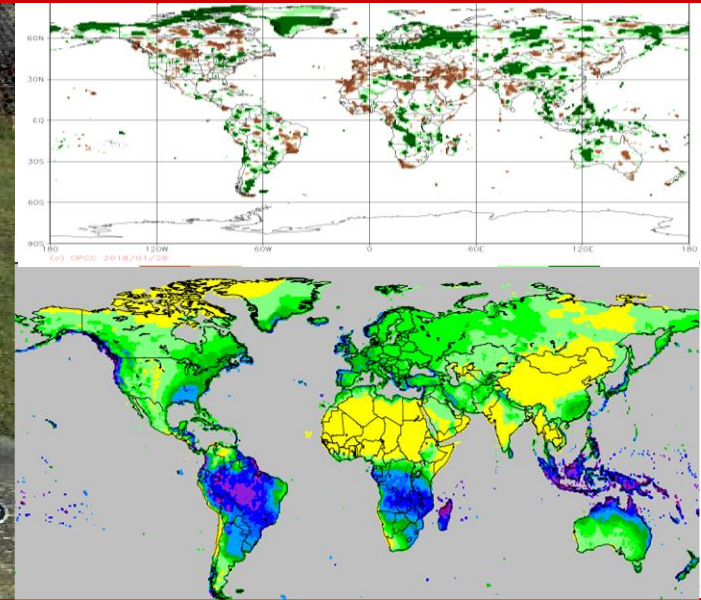
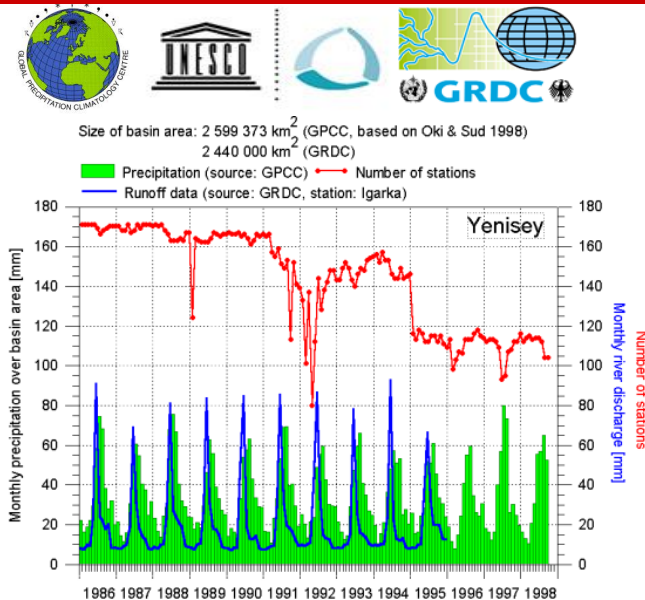


# Introduction into status and agenda of the Global Precipitation Climatology Centre (GPCC) operated by DWD since early 1989



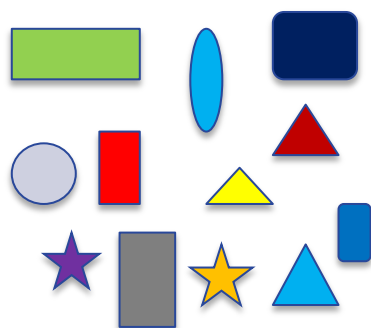
**Andreas Becker<sup>1</sup>, Jan Nicolas Breidenbach, Peter Finger, Siegfried Fränkling, Astrid Heller, Bruno Heller, Kira Rehfeldt, Elke Rustemeier, Zora Schirmeister, Udo Schneider, Raphaela Schulze, Jakub Walawender, Markus Ziese**

**<sup>1</sup>Head Precipitation Monitoring Unit and Global Precipitation Climatology Centre  
Hydrometeorological Department, Deutscher Wetterdienst**

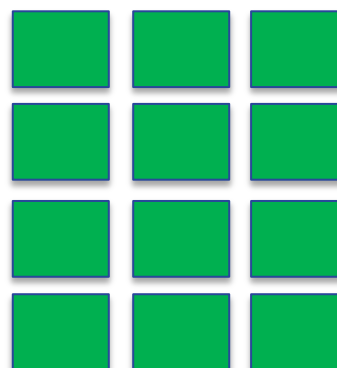
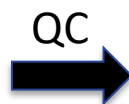
# The Global Precipitation Climatology Centre (GPCC)

- ➔ Was established over 30yrs ago in 1989 at Deutscher Wetterdienst
- ➔ GPCC's main task is the collection, quality control and archival of in-situ precipitation observations
- ➔ GPCC data archive holds data from more than 124000 stations from 195 Countries and Regions
- ➔ GPCC provides monthly and daily analysis of land surface precipitation on basis of its world-wide largest data archive disseminated into the public domain
- ➔ GPCC represents a German contribution to the global climate observing system (GCOS) and climate research on behalf of WMO
- ➔ Typical Apps:
  - ➔ Global Precipitation and Drought Monitoring
  - ➔ Assessment of global water resources
  - ➔ Analyses of climate variability and trends
  - ➔ Global Energy and Water cycles assessment

Data delivered in different formats



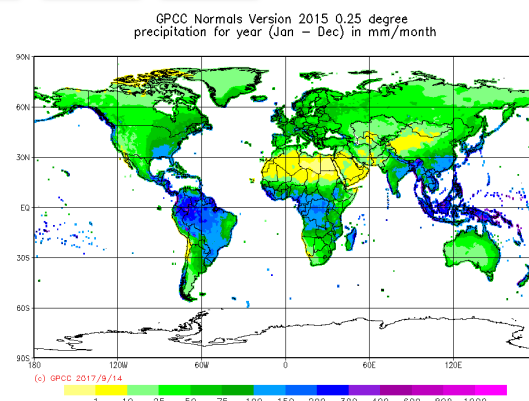
All data reformatted to same format



Data stored in data bank



Data extracted for analyses



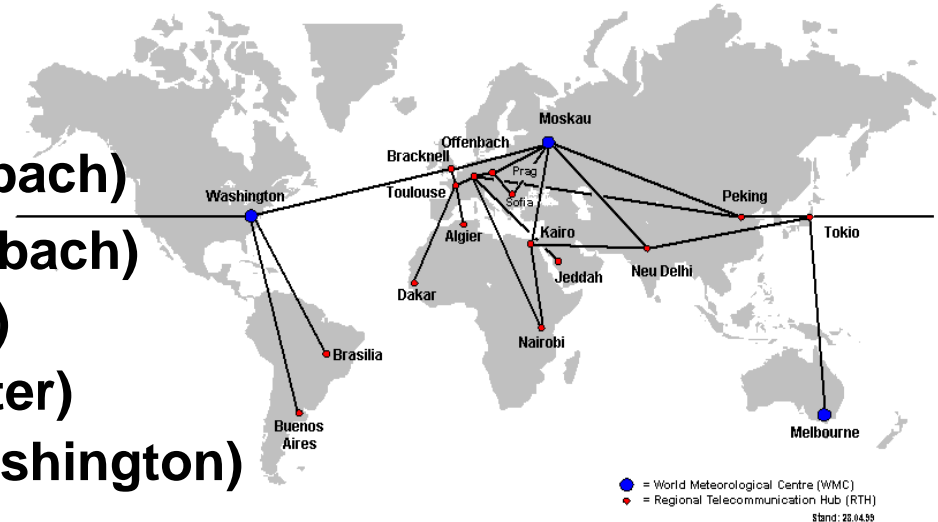
# GPCC data sources

## Near real-time (GTS):

- GTS SYNOP (**DWD** RTH Offenbach)
- GTS CLIMAT (**DWD** RTH Offenbach)
- GTS CLIMAT (**JMA** RTH Tokyo)
- GTS CLIMAT (**UKMO** RTH Exeter)
- SYNOP-based (**NOAA** RTH Washington)

## Main Telecommunication Network (MTN)

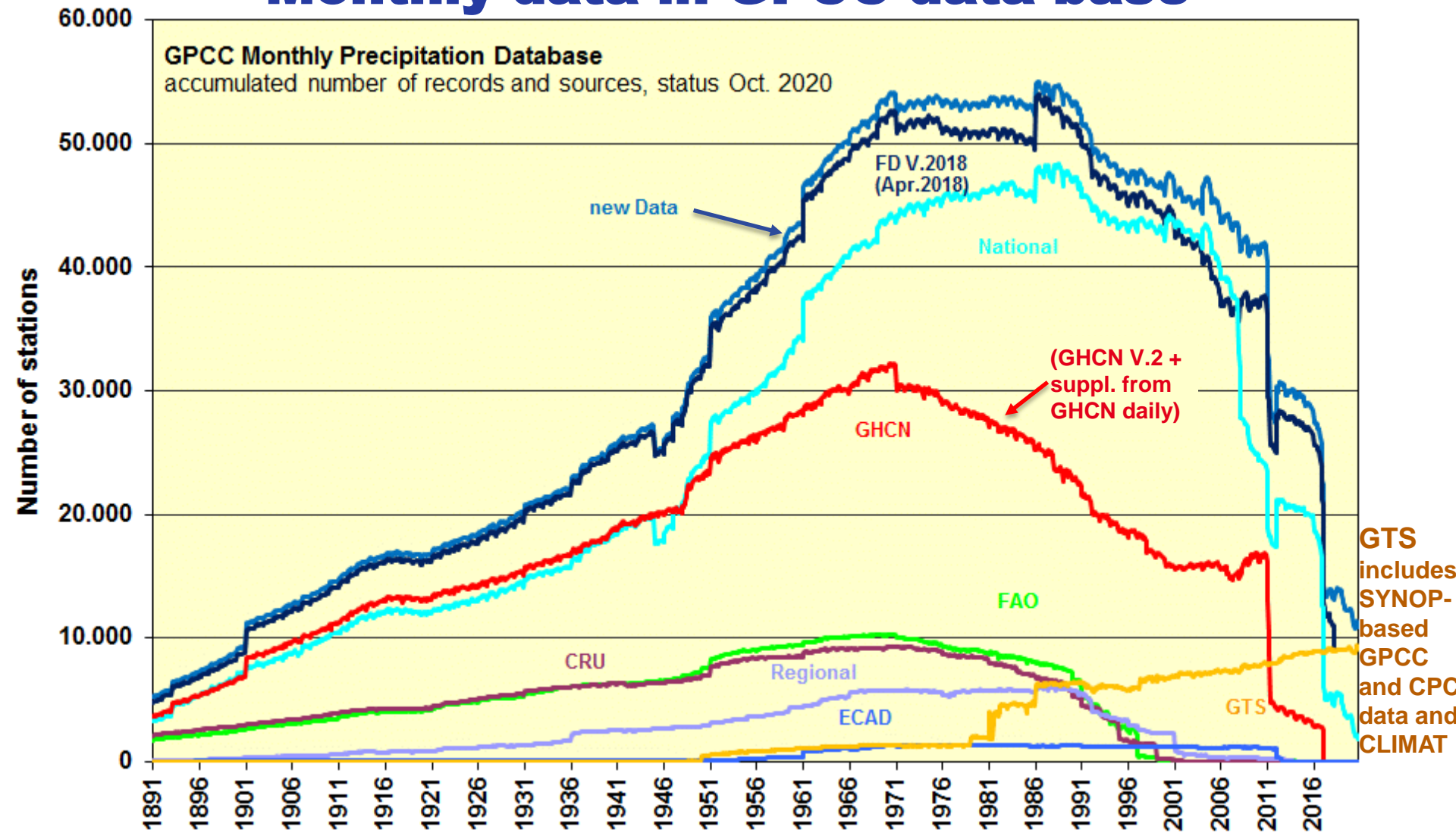
ein globales, standardisiertes Netzwerk zur Verteilung von Wetterdaten innerhalb der WMO Mitgliedsstaaten



## Non real-time:

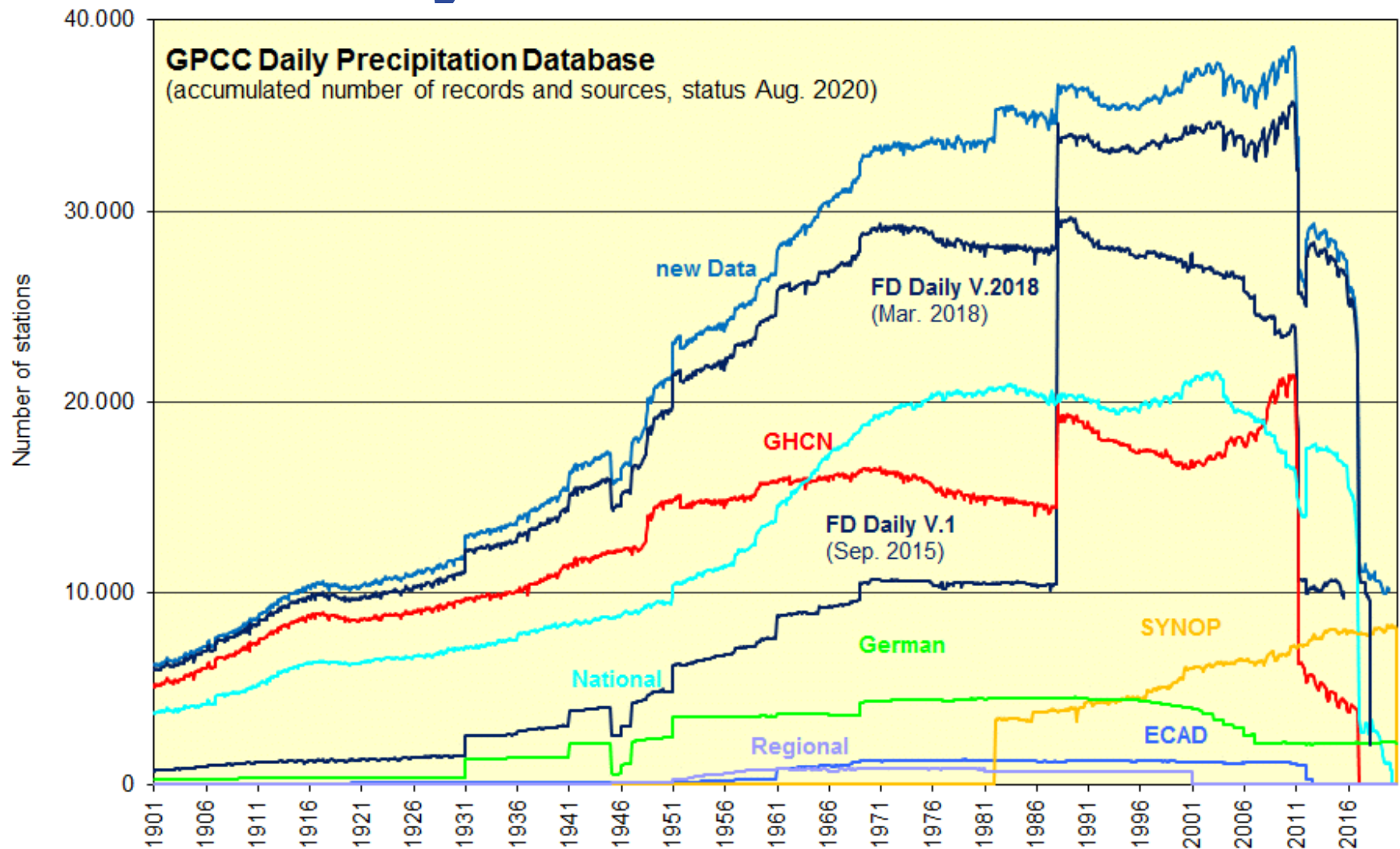
- Additional data from **ca. 190 countries**
- International project data (**GEWEX-related** and other)
- Historical data collections (**CRU, FAO, GHCN, ECA&D**)  
**+ GHCN daily**

# Monthly data in GPCC data base





# Daily data in GPCC data base



# GPCC Station availability in the WS countries for daily totals

Country	Total # of stations with observations	temporal coverage	Total # of observations	last updated (despite GTS)
Afghanistan	91	1982-2020	11423	none
Armenia	65	1982-2021	227701	last on 27.09.2005
Azerbaijan	91	1982-2021	105310	last on 29.12.2016
Bangladesh	66	1947-2021	719174	last on 01.07.2009
Egypt	137	1982-2021	345162	last on 20.07.2009
India	3736	1982-2021	1097658	last on 03.08.2006
Iran	3646	1951-2021	21801367	last on 18.07.2019
Iraq	99	1988-2021	100947	last on 03.07.2007
Oman	211	1982-2021	360796	last on 23.08.2009
Qatar	21	1982-2021	25039	last on 17.08.2004
Syria	35	1982-1965	323222	last on 20.10.2005
Tajikistan	72	1982-2021	125698	none
Turkey	431	1982-2021	1097357	last on 18.04.2017
Uzbekistan	108	1961-2021	515033	last on 19.04.2011

## Data supplements since GPCC V.2020

- Additions mainly for Sweden, Finland, Poland, Iran etc.
- Oman sent daily data in 8 books several years ago; data have been scanned by DWD library staff and digitized (OCR software) by GPCC for 210 stations



## QC of precipitation data - Summary

- Almost every large data set is containing more or less frequently erroneous data
- “Bad data” should not simply be thrown away, but corrected where possible (data errors are often obvious and thus can be corrected (*data maybe important in data sparse areas*))

### Important:

- True extreme values must not be eliminated by “QC” (therefore **semi-automatic QC at GPCC**; automatic pre-checks and visual control of data flagged as questionable)
- Corrected data always archived together with the original data
- GPCC is archiving the data from different sources separately in source-specific slots in its relational data base management system (RDBMS) to enable intercomparison of the data from the different sources

➤ **Careful data QC is necessary !!**

# User requirements

- **Features** of gridded precipitation data as required by the users:
- **Timeliness** (for drought monitoring)
  - **High resolution** (for regional structures in global maps)
  - **High accuracy** (for verification of model results)
  - **Homogeneity** (for climate change and variability analysis)

All of these requirements cannot be met by one single gridded data set

==>

A portfolio of different analysis products has been designed and optimized with respect to the **application purposes**

## Visualize and Download GPCC Products

GPCC Product	Spatial Resolution	Time Coverage	Possible Application
<i>First Guess Monthly</i>	<b>1.0°</b>	<b>2004 - present</b>	<i>drought monitoring</i>
<i>First Guess Daily</i>	<b>1.0°</b>	<b>2009 - present</b>	<i>analysis of extremes</i>
<i>Monitoring Version 2020</i>	<b>1.0°, 2.5°</b>	<b>1982 - present</b>	<i>calibration of satellite data</i>
<i>Full Data Monthly Version 2020</i>	<b>0.25°, 0.5°, 1.0°, 2.5°</b>	<b>1891 - 2019</b>	<i>hydrological studies</i>
<i>Full Data Daily Version 2020</i>	<b>1.0°</b>	<b>1982 - 2019</b>	<i>analysis of extremes</i>
<i>HOAPS/GPCC global daily precipitation Version 2</i>	<b>0.5°, 1.0°, 2.5°</b>	<b>1988 - 2015</b>	<i>analysis of extremes</i>
<i>HOMPRA Europe Version 1</i>	<b>0.5°, 1.0°, 2.5°</b>	<b>1951 - 2005</b>	<i>trend analysis</i>
<i>Precipitation Climatology Version 2020</i>	<b>0.25°, 0.5°, 1.0°, 2.5°</b>	<b>1951/2000</b>	<i>for application as a reference, and for utilization of the anomaly interpolation method</i>
<i>Interpolation Test Dataset</i>	<b>1.0°</b>	<b>1988</b>	<i>comparison of interpolation schemes</i>
<i>Drought Index Version 1</i>	<b>1.0°</b>	<b>2013 - present</b>	<i>drought monitoring</i>
<i>Drought Index Version 1.1</i>	<b>1.0°</b>	<b>1952 - 2013</b>	<i>drought monitoring</i>
<i>GPCC Visualizer</i>			<i>access to the GPCC Visualizer, where you can create maps with your own coordinates and parameters</i>
<i>GPCC Home</i>			<i>detailed information about GPCC</i>
<i>Many thanks to the data suppliers</i>			<i>country list of data suppliers</i>

The Global Precipitation Climatology Centre (GPCC) is a specialized Centre supporting climate monitoring and research. It is operated by DWD under the auspices of WMO. Product users are kindly asked to refer to GPCC.

**Thank you  
for  
your attention!**

**GPCC is planning a new V.2021 by end of 2021**

[https://opendata.dwd.de/climate\\_environment/GPCC/html/download\\_gate.html](https://opendata.dwd.de/climate_environment/GPCC/html/download_gate.html)