The Global Precipitation Climatology Centre (GPCC) at the Deutscher Wetterdienst (DWD)

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The Global Precipitation Climatology Centre GPCC

Established by the World Meteorological Organization **WMO** in the year **1988**

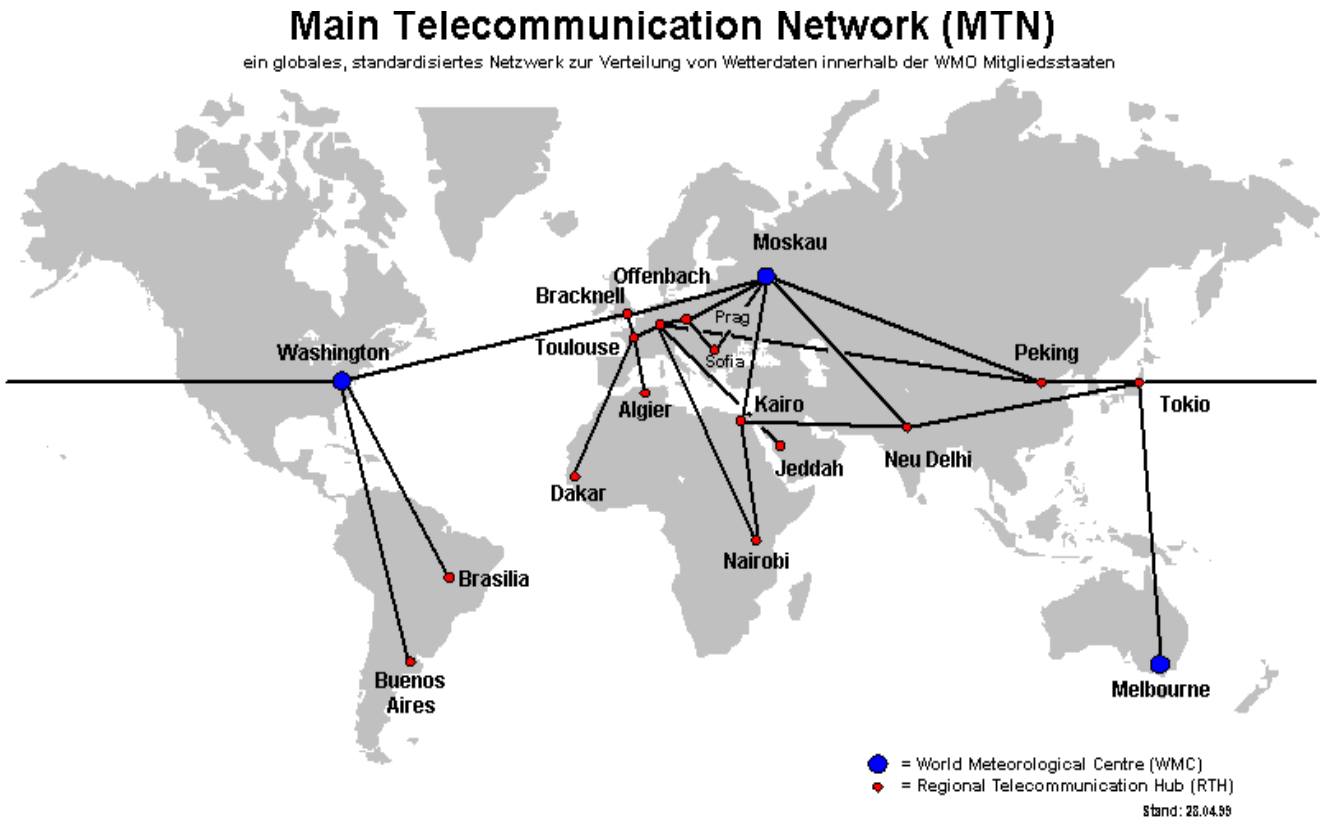
- undertaken by Deutscher Wetterdienst **DWD**
- contributes to the Global Climate Observing System **GCOS,** the World Climate Research Programme **WCRP,** and the Global Earth Observation System of Systems **GEOSS**
- thousends of users world-wide
- scientific task: quantitative assessment of global precipitation and investigation of the global water cycle

GPCC data base

Near realtime precipitation observation data regularly exchanged via the WMO Global Telecommunication System:

- **few hourly weather reports (SYNOP) -> 6500 stations**
- **monthly climatological totals (CLIMAT) -> 2300 stations**

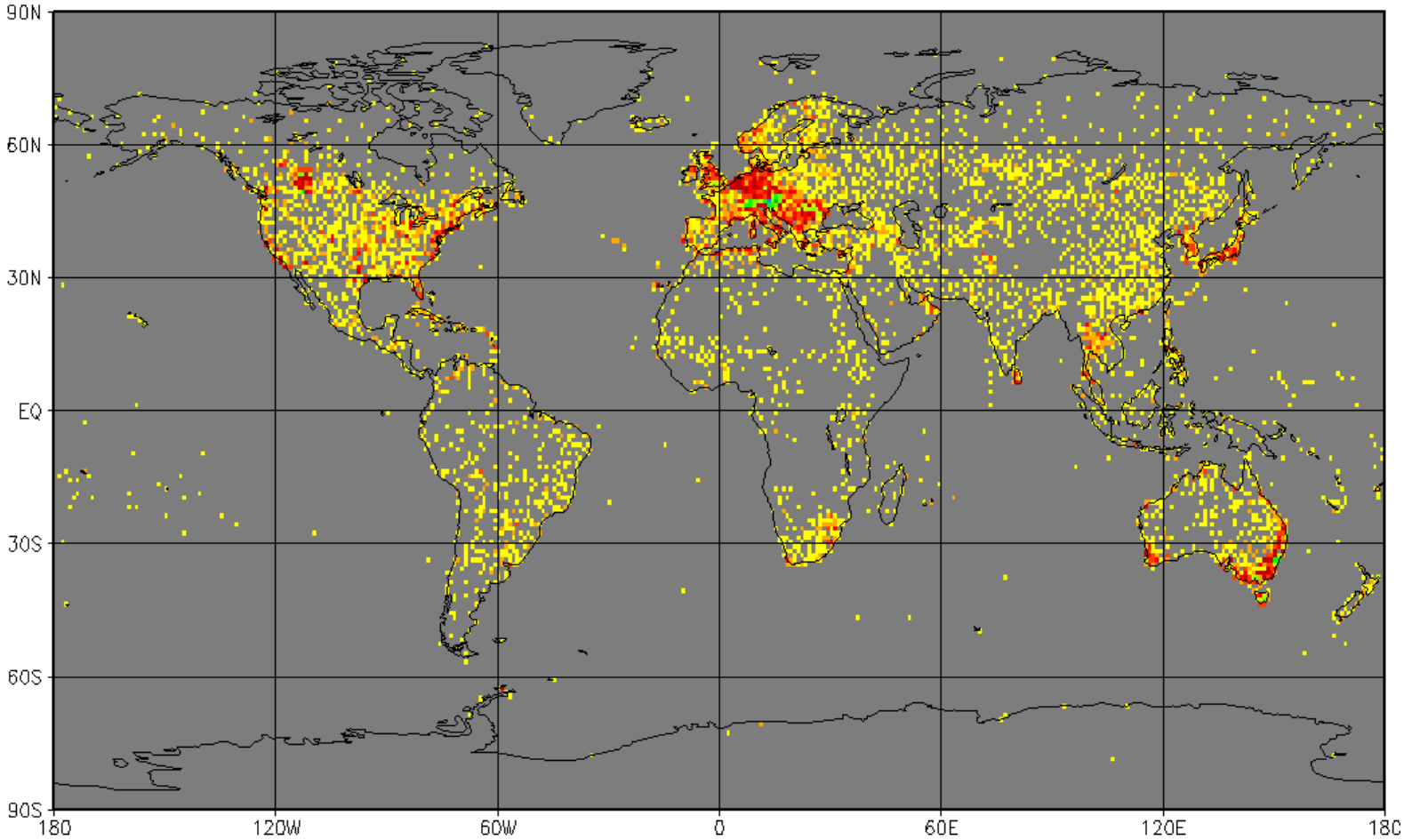
=> 8000 stations

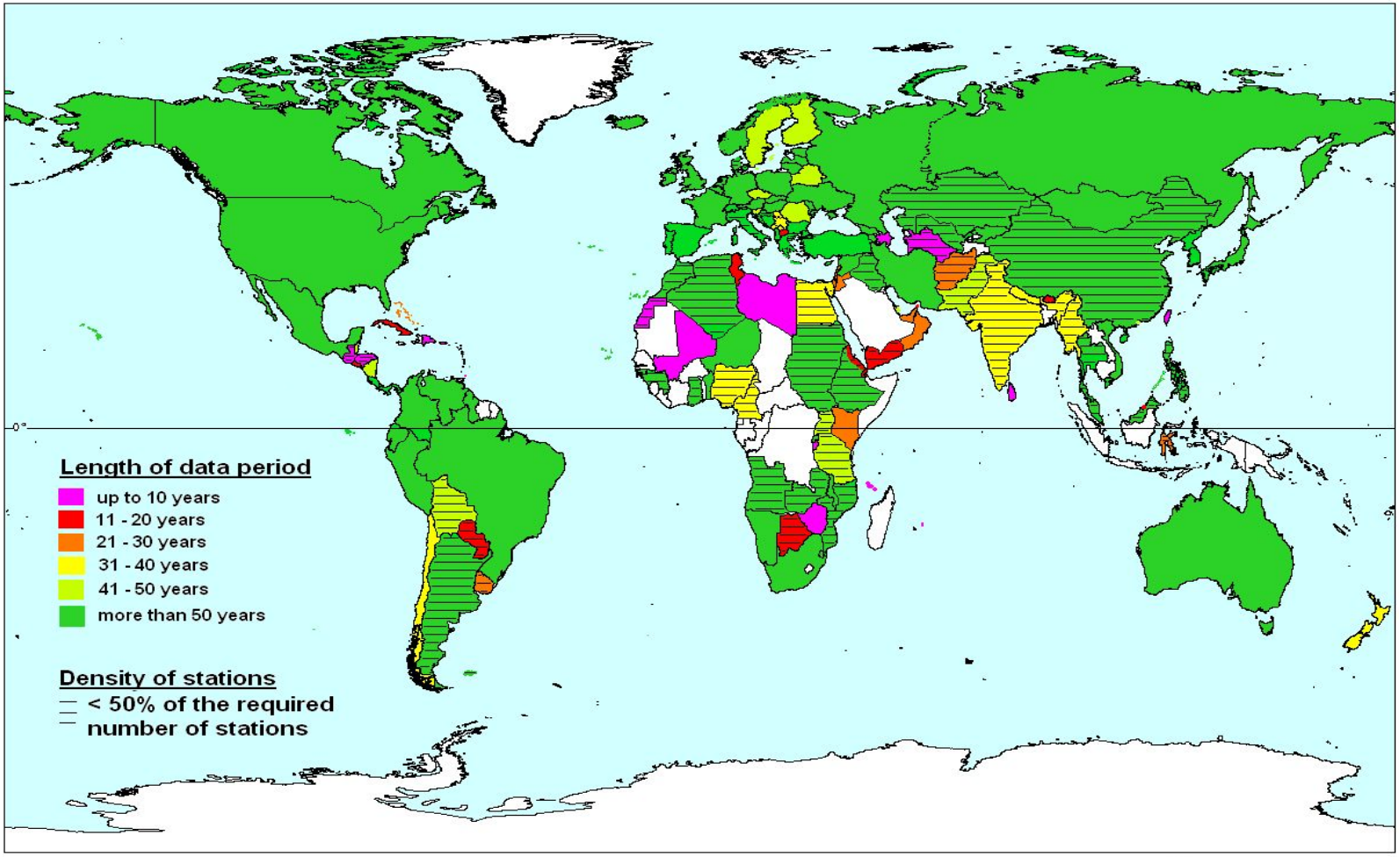


Deutscher Wetterdienst

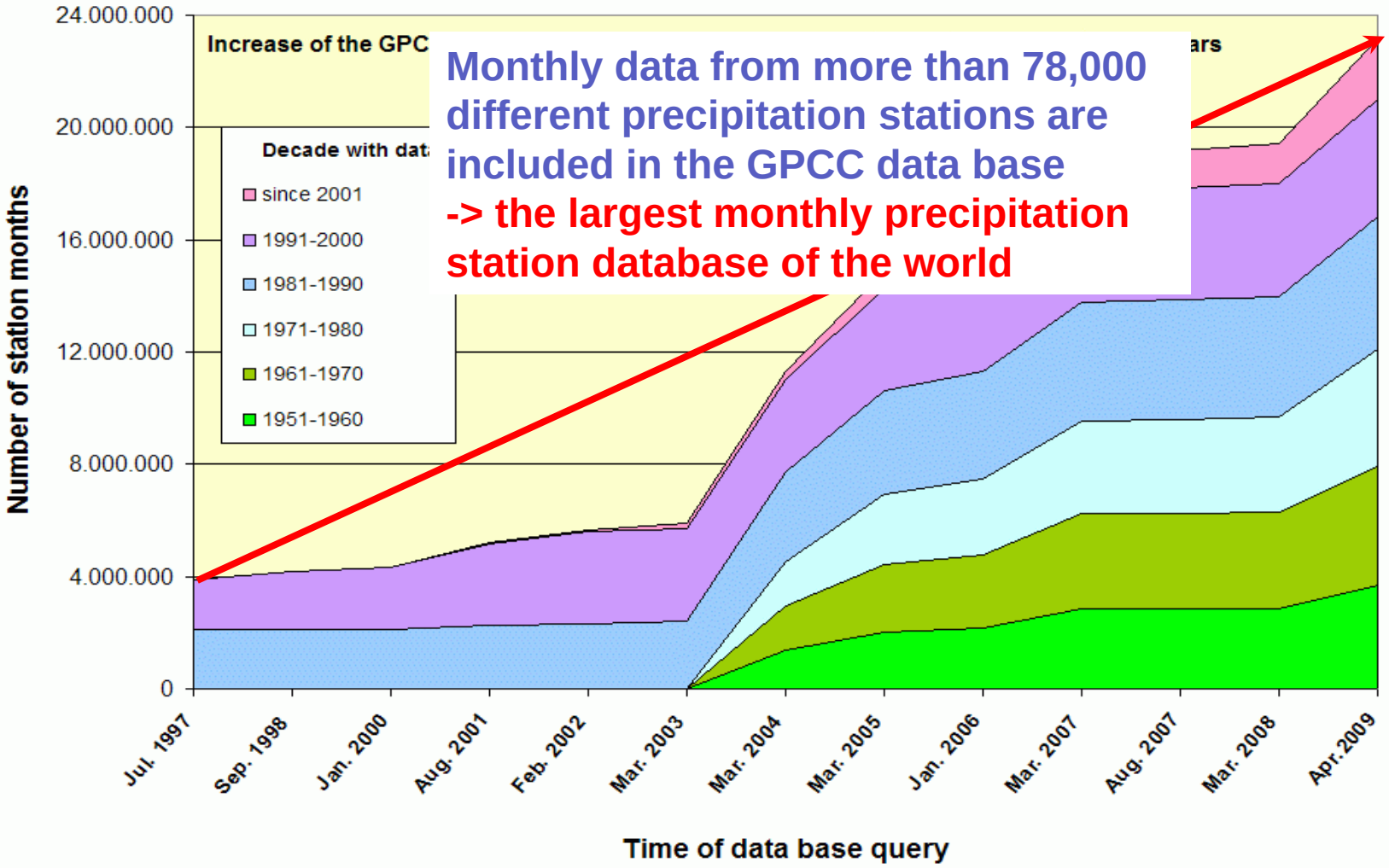
Near real-time GTS data based analysis in 1° x 1° spatial resolution

GPCC Monitoring Product Gauge–Based Analysis 1.0 degree
number of stations per grid for October 2008





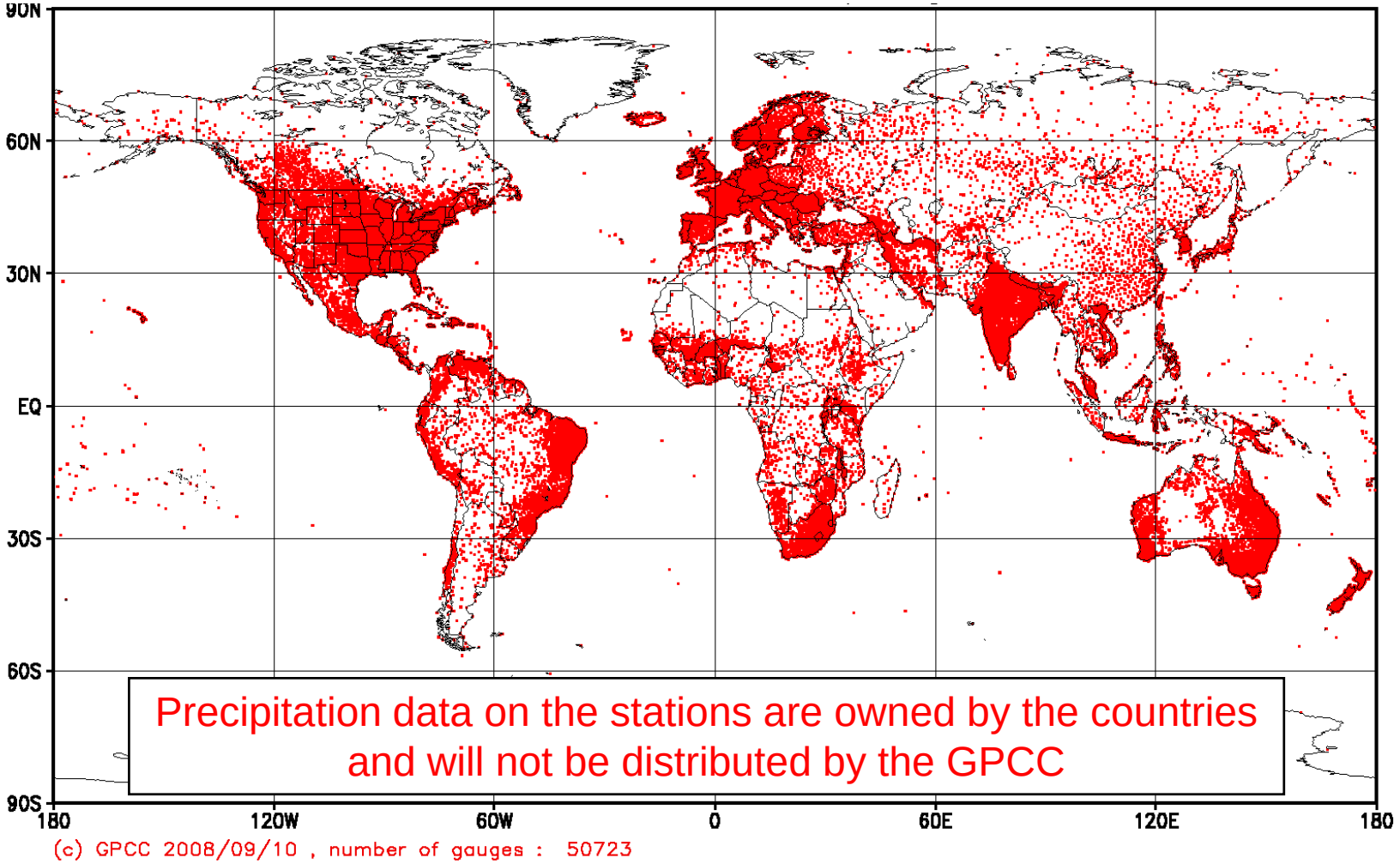
Data contributions by about 180 countries to GPCC



Temporal evolution of the GPCC Database from July 1997 until April 2009

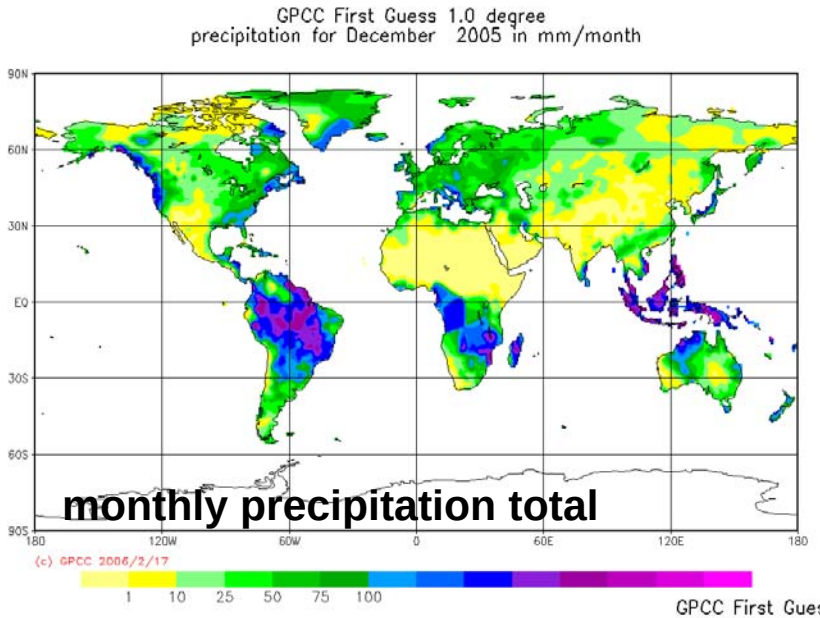
Station sites

Total number of stations: 50,650

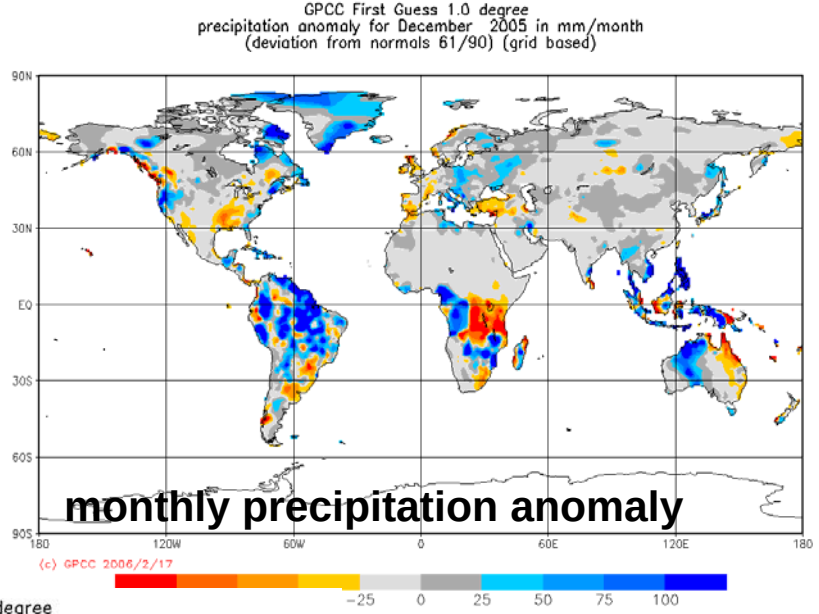


Precipitation data on the stations are owned by the countries and will not be distributed by the GPCC

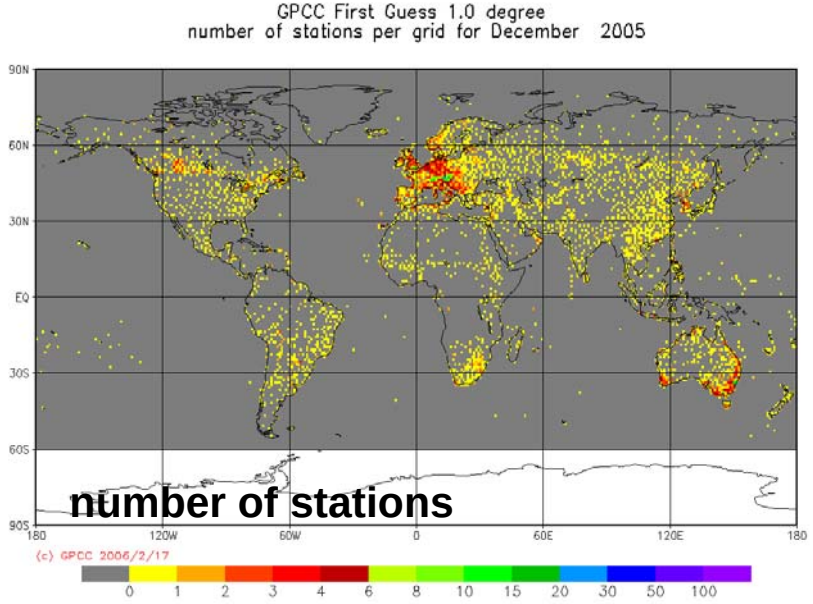
Standard GPCC products provided on the grid



monthly precipitation total



monthly precipitation anomaly



number of stations

Application areas of GPCC products:

- Drought monitoring
- Verification of climate and NWP models
- Investigation of the interactions between the global energy and water cycle
- Assessment of global water resources
- Validation/Calibration of remotely sensed precipitation estimations
- Analysis of climate variability and trends

GPCC near real-time Analysis Products

First Guess Product

Application: Drought Monitoring

(Users: FAO, DMCSEE, and others)

Available: **3 - 5 days after end of month**
Data base: **6,300 stations**
Data source: **SYNOP data only**
Quality control: **automatic only**
Available products: **Only the current product**

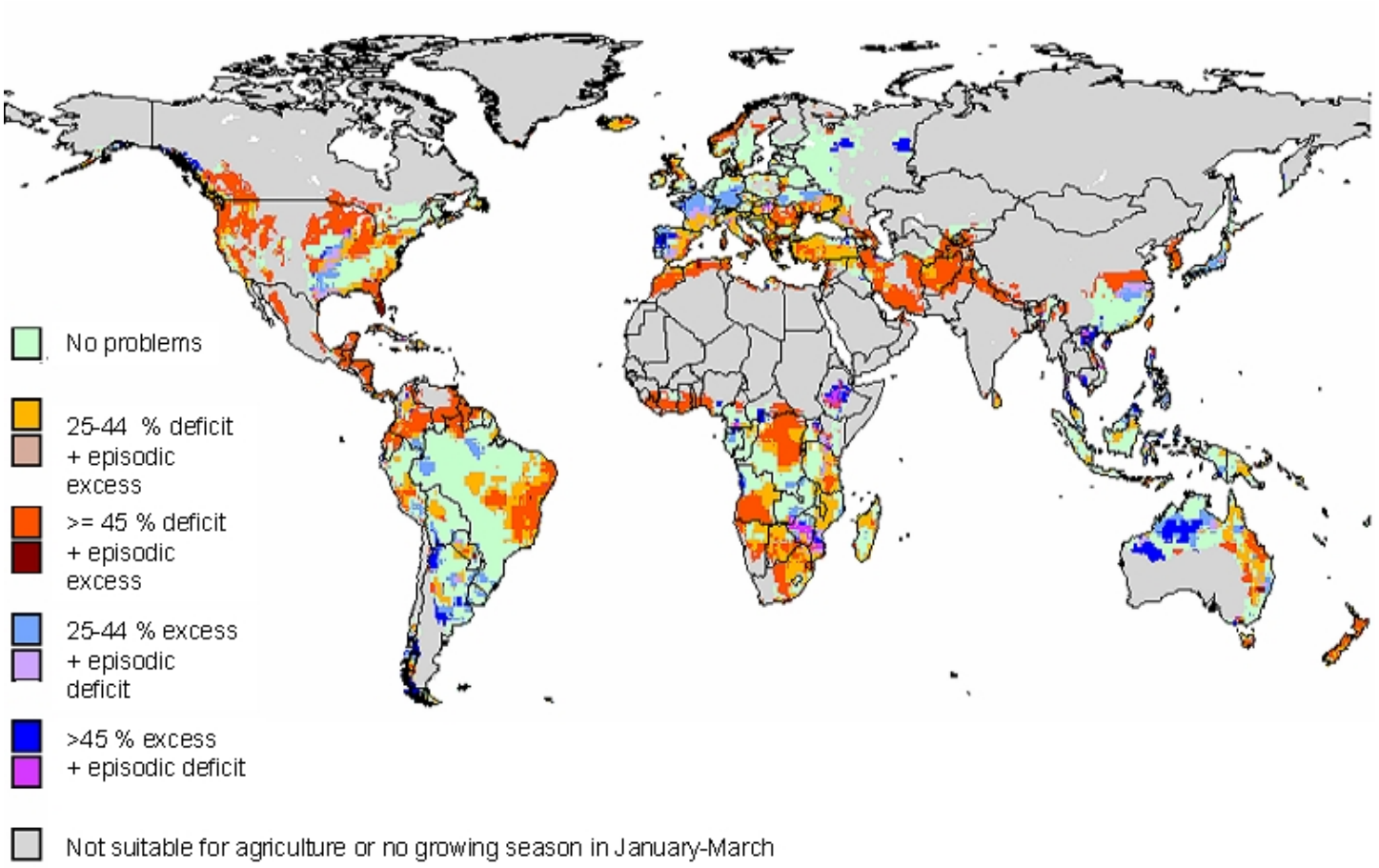
Monitoring Product

Application: Precipitation Monitoring

(Users: WCRP/GEWEX/GPCP, CMAP, GCOS, and others)

Available: **2 months later**
Data base: **8,000 stations**
Data sources: **SYNOP data plus monthly CLIMAT and CPC**
Quality control: **automatic and visual**
Available products: **From Jan. 1986 up to near present**

Global Water Stress Map

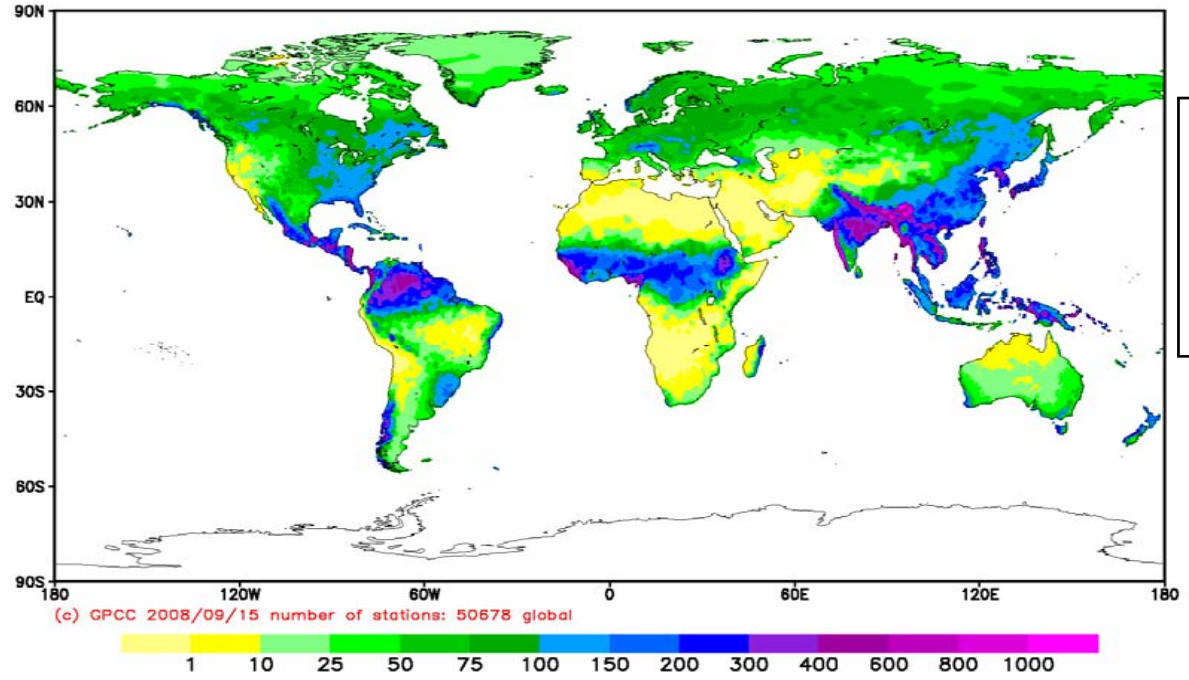


GPCC First Guess Product based application under development at FAO (Example provided by M. Bernardi, FAO, Rome, 2007)

GPCC non real-time Analysis Products

GPCC just finalised a new Global Monthly Precipitation Climatology:

- **-> based on more than 50,000 stations with at least 10 years of data;**
- **-> intensive QC of metadata and data;**
- **-> spatial grid resolution: 0.25° , 0.5° , 1° , 2.5° ;**
- **-> used as background climatology for GPCC analysis products.**



GPCC's new precipitation climatology: **July**

GPCC non real-time Analysis Products

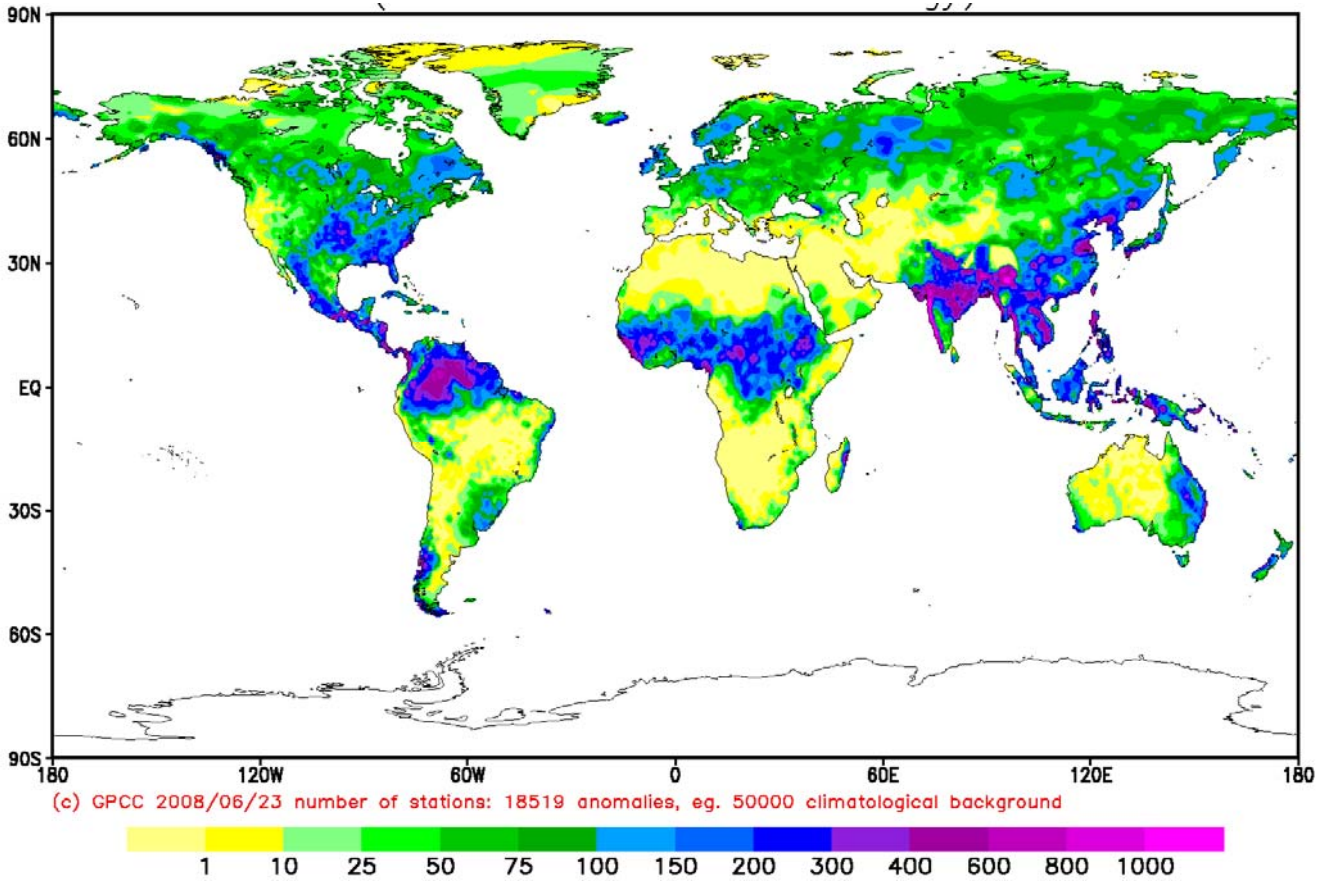
GPCC just finalised a new

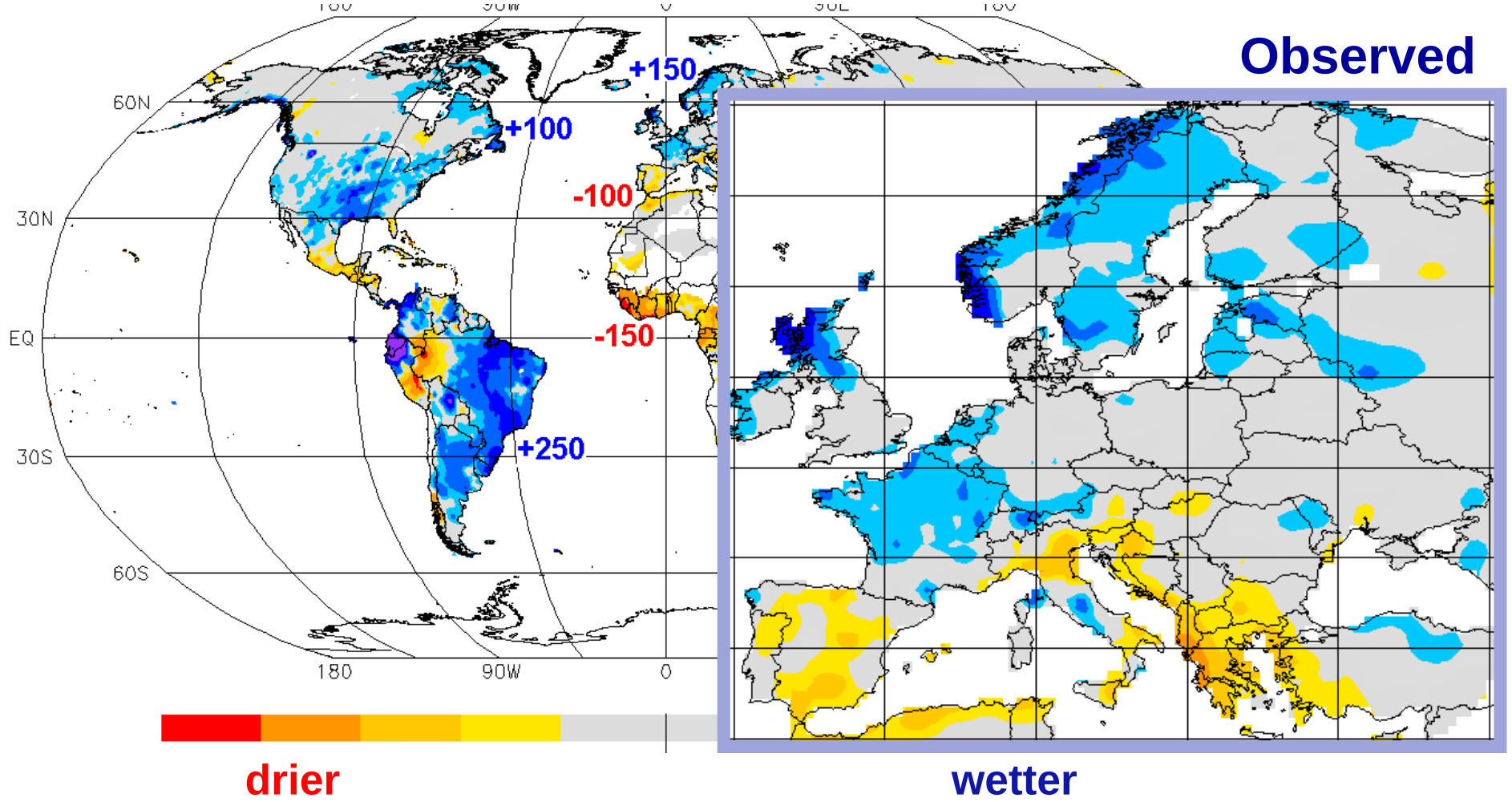
Full Data Global Precipitation Reanalysis (Version 4):

- **-> analyses for all months of the time period 1901-2007;**
- **-> intensive QC of metadata and data;**
- **-> using the GPCC global precipitation climatology as background;**
- **-> spatial grid resolution: 0.5°, 1°, 2.5°**

GPCC non real-time Analysis Products

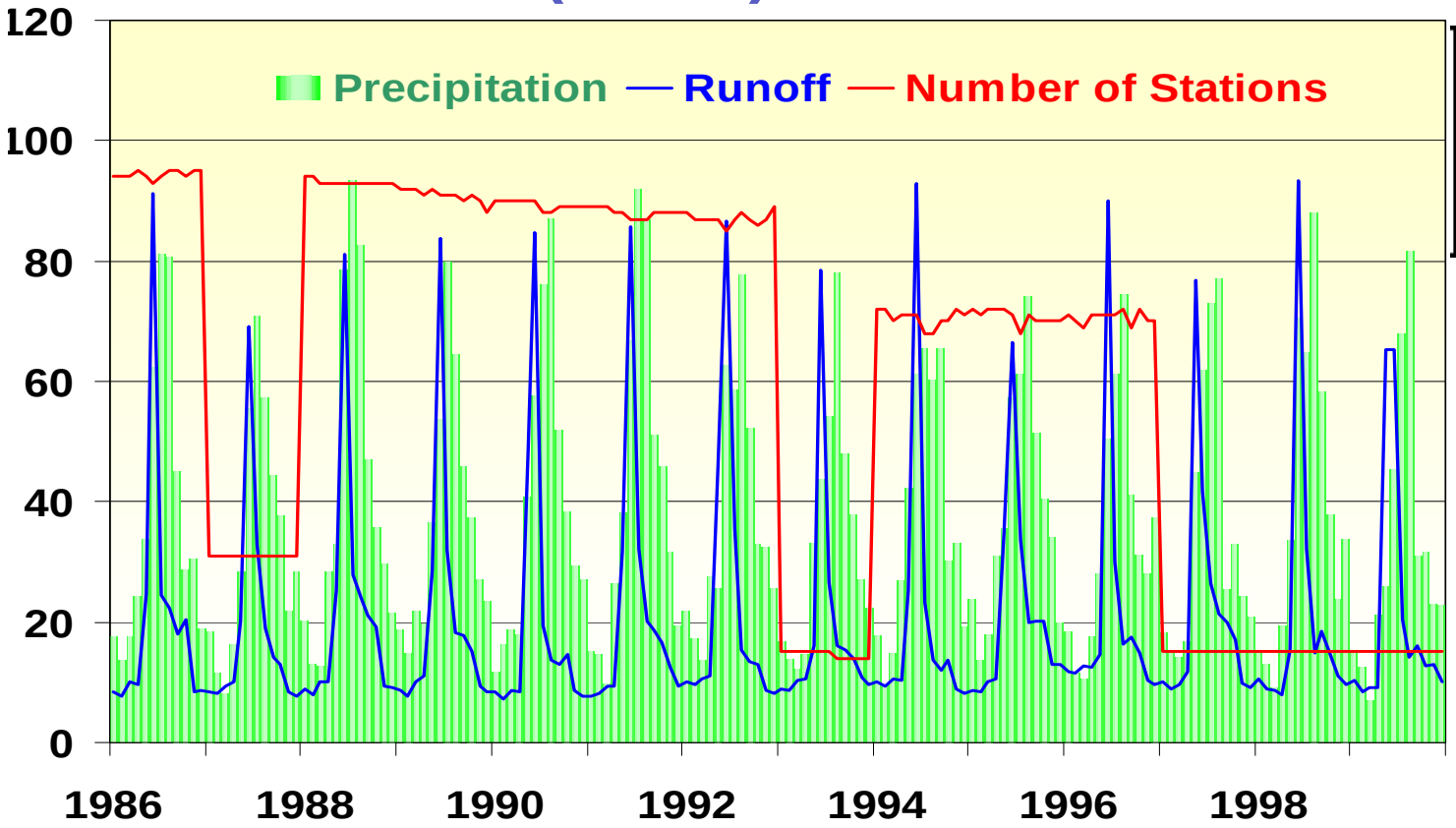
Example:
New GPCC Global precipitation reanalysis for July 1950;
spatial resolution: 0.5°





Observed change of annual precipitation (mm) from 1951 to 2000

Comparison of precipitation (GPCC) and river run-off (GRDC) variation at Jenisei river in Siberia



Green area indicates the analysis region

-> Joint GPCC-GRDC projects under umbrella of UNESCO/WMO/GEO

GPCC Users and cooperation partners:

Institution	Application
• GCOS	Global climate monitoring applications
• WCRP/GEWEX	Analyses of hydrometeorol. processes and adjustment of satellite-based observation
• WMO WWW	CLIMAT network monitoring (RBCN/GSN)
• WMO WCP	Annual Report on global climate status
• WMO HWRP	Contribution to GTN-H development
• IPCC	Climate variability and trend analyses
• ECMWF, UKMO	NWF model verification
• GEO	Contribution to GEOSS Implementation
• FAO, UNEP	Input for drought monitoring applications
• UNESCO IHP	Water resources assessment

…and many researchers worldwide…

Conclusions

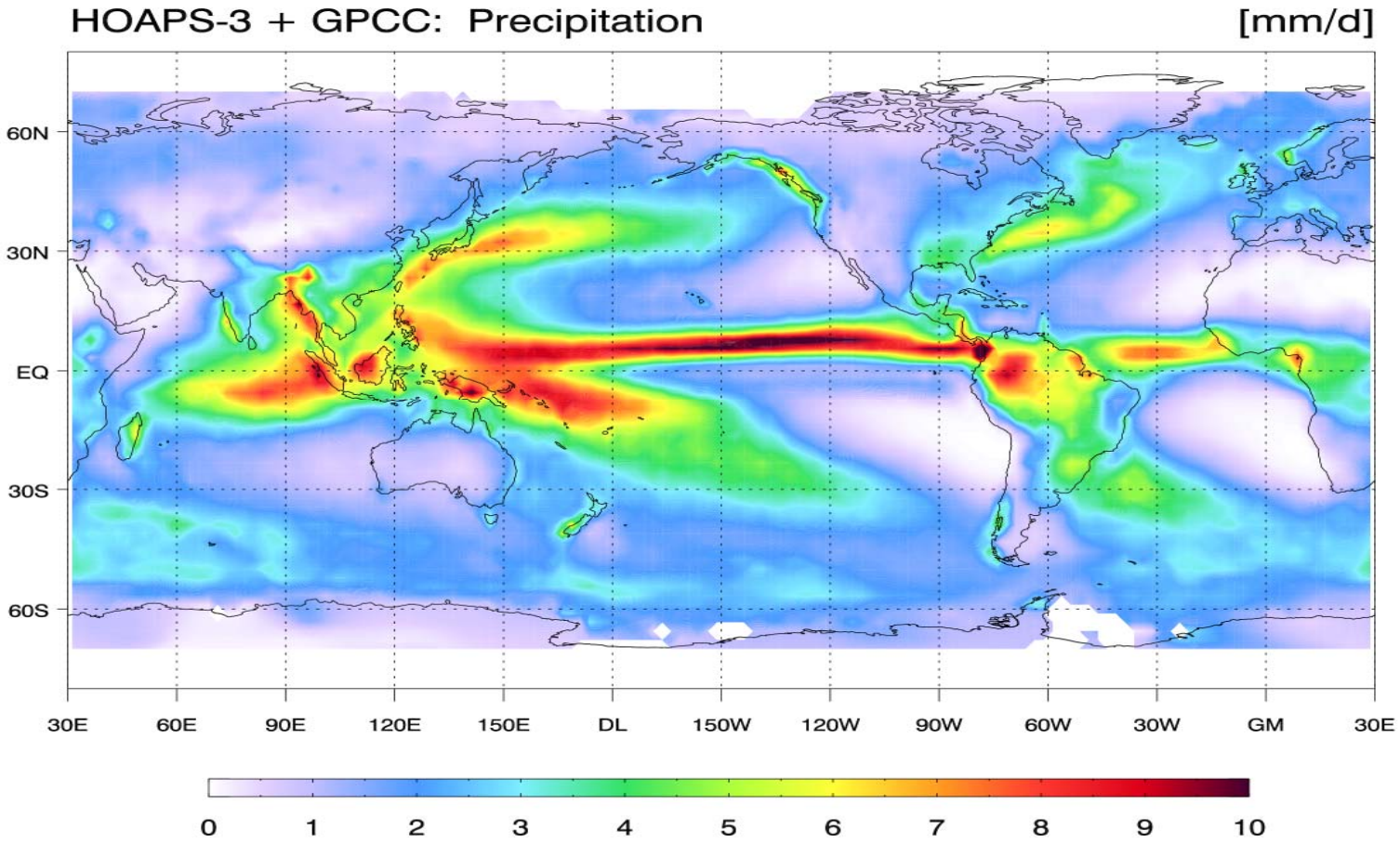
GPCC finalised in May 2008 a new Global Monthly Precipitation Climatology based on the largest monthly precipitation station database of the world;

- **On the basis of the new background climatology the GPCC products have been reprocessed (as anomalies from the climatology)**
  - **Monitoring Product (V. 2), Jan. 2007-present, incl. 6,000-8,000 stations available since end of Sept. 2008**
  - **Full Data Reanalysis (V. 4), 1901-2007, incl. 8,000-45,000 stations available since end of Sept. 2008**
  - **VASClimO 55-year Analysis (V. 2), 1951-2005, ca. 16,000 stations will become available in autumn 2009**

-> GPCC Product Mapping and Access: http://gpcc.dwd.de

Outlook 2012?

WCRP/GEWEX and WMO RCC demand: Daily global precipitation analyses



Courtesy: S. Bakan, MPI-M, Hamburg

Example: Combination of HOAPS and GPCC climatology 1994-2004

More Information on GPCC:

GPCC - VISUALIZER

DATASET	GPCC Landsurface Monitoring Product 1.0 °	COASTLINES	LOWRES
PRODUCT	MEAN PRECIPITATION (mm/month)	OUTPUT	GIF
PERIOD	DECEMBER	GIF-SCALE	1.0
YEAR	2003 (for winter 86/87 eg. select 1987)	SHOW	GRID
Menu AREA	GLOBAL (-180°/+180°) LON_min -180. LON_max +180. LAT_min -90. LAT_max +90. ZOOM-Window	COLOR	COLOR
Userdefined		PROJECTION	LAT/LON

START VISUALISATION

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