

Overview of the gridded daily and monthly precipitation data sets provided by the Global Precipitation Climatology Centre (GPCC)

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Since its founding in 1989, the Global Precipitation Climatology Centre (GPCC) has been producing global precipitation analyses based on land surface in-situ measurements. During these years the precipitation database has been continuously expanded and includes a high station density and large temporal coverage. Due to the semi-automatic quality control routinely performed on the incoming station data, the GPCC database has a very high quality. Today, the GPCC holds data from more than 129,000 stations.

With an update cycle of two to three years, this year will see an update of the high-quality data products under intensive quality control. The basis for this is the entire GPCC database. This update will be used as an opportunity to simplify the product range and harmonize the 'Full Data Product' with the 'Monitoring Product'. This will ensure that a combined product with regular monthly updates is created. These new non-real-time products include **Climatology**, **Monthly** and **Daily**.

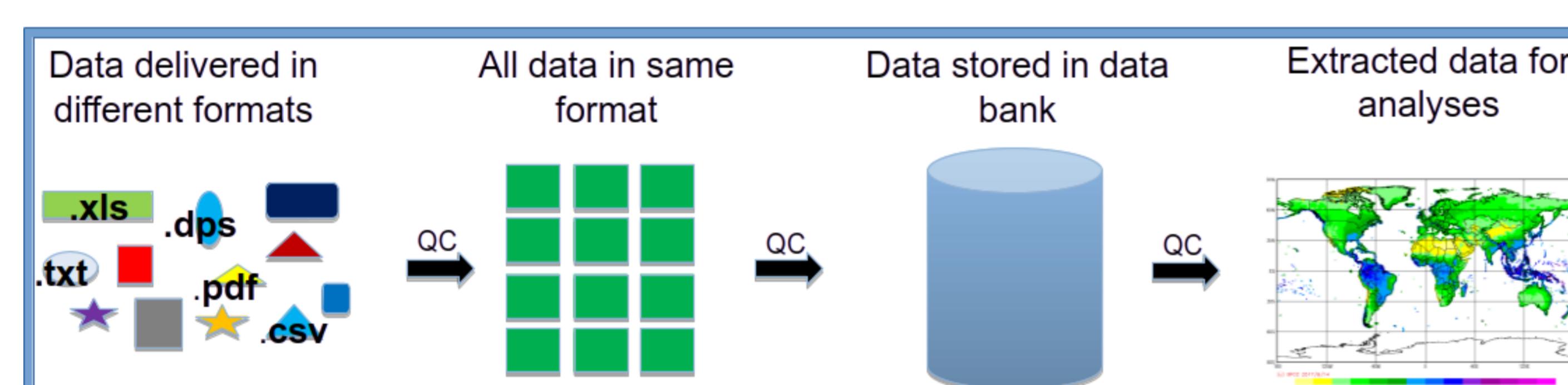


Fig. 1: Data processing at GPCC - from data acquisition to the end product.

The core of the analyses is formed by data from the global meteorological and hydrological services, which provided their records to the GPCC, as well as national meteorological and hydrological services from all over the world. In addition, the GPCC receives SYNOP and CLIMAT reports via the WMO-GTS.

Quality control activities include cross-referencing stations from different sources, flagging of data errors, and correcting temporally or spatially offset data.

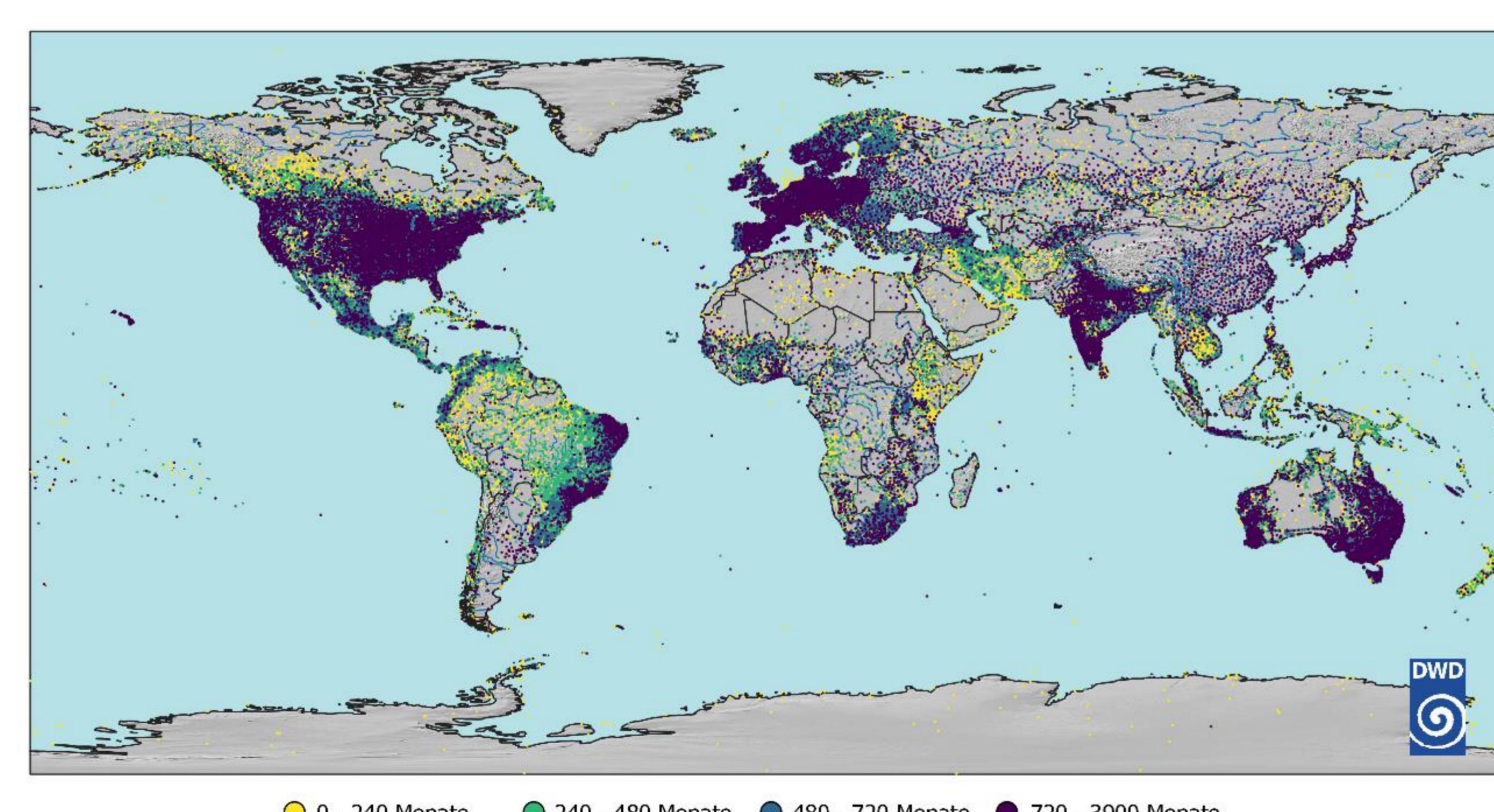


Fig. 2: GPCC data collection, consisting of data from more than 129,000 stations.

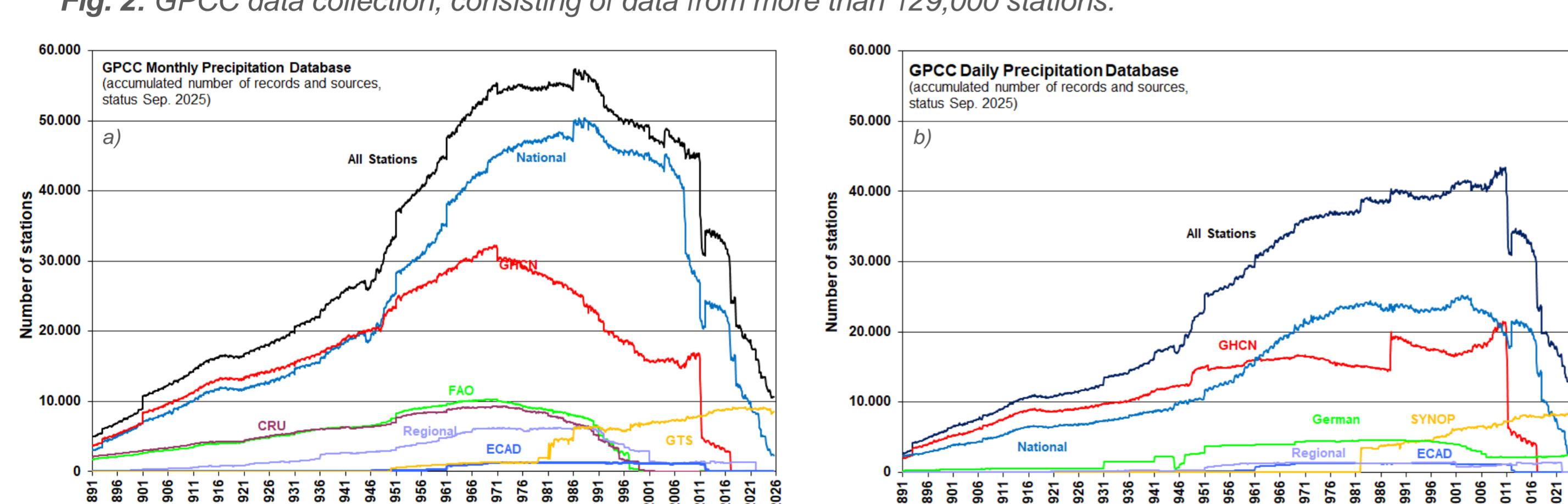


Fig. 3: Data coverage by time and data source for a) monthly data and b) daily.

Many thanks to all data providers without whom these analyses would not be possible!

The GPCC is currently working on a new product version with the new **Climatology**, **Monthly** and **Daily** products. These are expected to be released between the end of 2025 and the beginning of 2026. The new **Monthly** and **Daily** products replace the previous **Full data** and **Monitoring** products, while the **Provisional** and **First Guess** products remain unchanged (see table).

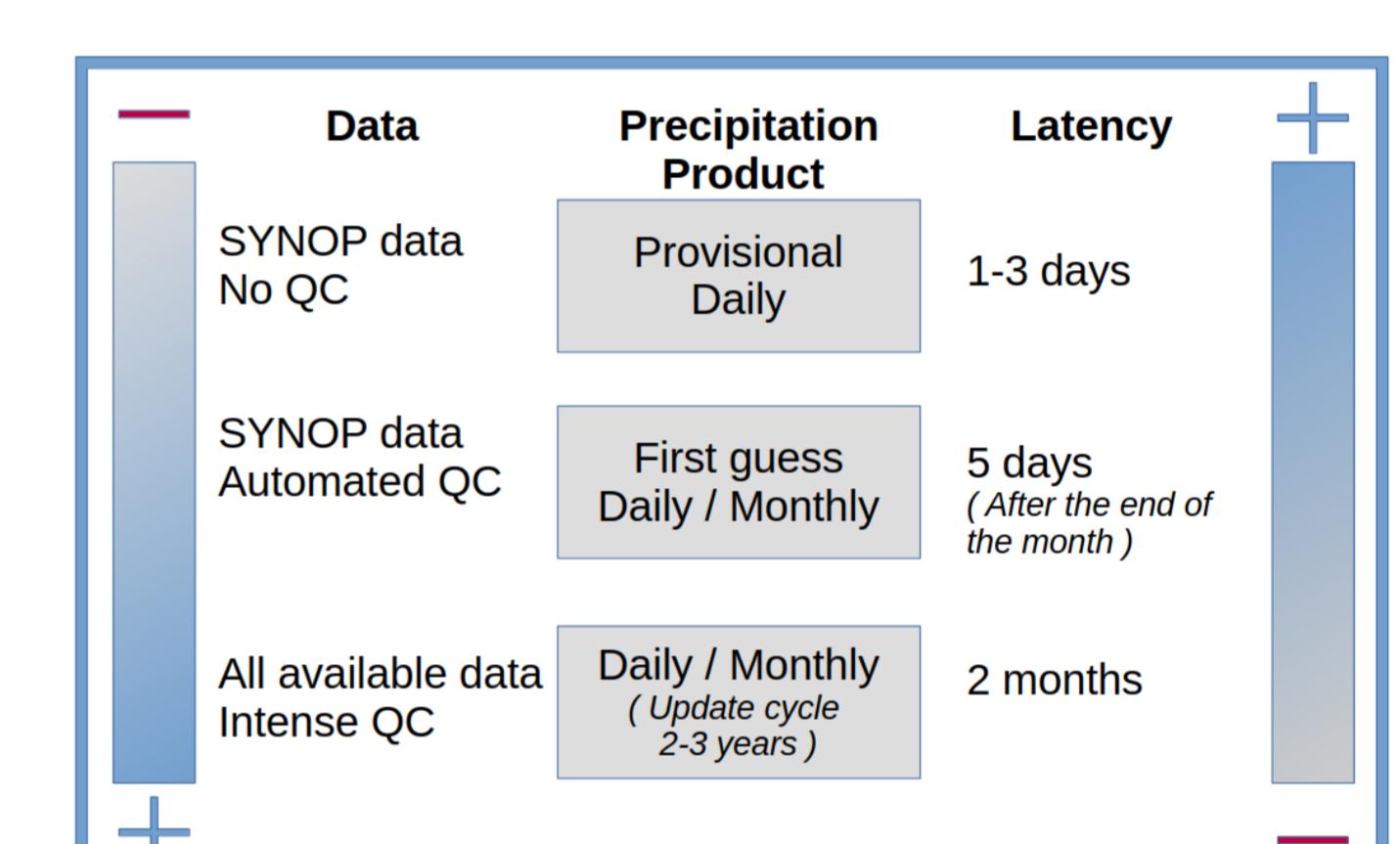


Fig. 4: Integration of the new Daily and Monthly products into existing Provisional and First Guess products.

Climatology

Long: GPCC precipitation analysis climatology

The *climatology* contains grid data covering all the 30-year periods between 1931-1960 and 1991-2020. In addition, the period 1951-2000 is also provided, which serves as a reference for all other products.

Monthly

Long: GPCC precipitation analysis monthly

The *Monthly* product provides gridded data from 1891 to the present with monthly updates.

Daily

Long: GPCC precipitation analysis daily

The *Daily* product provides gridded data from 1982 to the present with monthly updates.

Tab.: Raster variables used for Climatology, Monthly and Daily products

| Variable | Description | Unit |
|-----------------|--|--------------------------------------|
| precip | Precipitation | mm / month |
| gauge | Number of gauges | number of gauges per grid cell |
| err | Interpolation error (YAMAMOTO) | mm / month |
| sys_err | GPCC undercatchment gauge error correction factor | Multiplier |
| legates_err* | Legates undercatchment gauge error correction factor | Multiplier |
| gauge_int | Number of gauges used by interpolation | Number gauges used for interpolation |
| dist_int | Mean distance of gauges used by interpolation | Mean distance in kilometer |
| liquid | Proportion of liquid precipitation | % / month |
| solid | Proportion of solid precipitation | % / month |
| precip_infill** | Precipitation with climatological station values infilling | mm / month |

* only in Climatology, ** not in Climatology

Download

The data can be downloaded without restriction and DOI referenced from the GPCC homepage.

DWD Open Data Portal:

https://opendata.dwd.de/climate_environment/GPCC/html/download_gate.html

Visualizer: <https://kunden.dwd.de/GPCC/Visualizer>



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