

CSP Precipitation

MARKUS KOTTEK

FRANZ RUBEL

markus.kottek@vu-wien.ac.at

Biometeorology Group, Department of Natural Sciences,
University of Veterinary Medicine Vienna, Veterinärplatz 1,
A-1210 Vienna, Austria

WP 8318

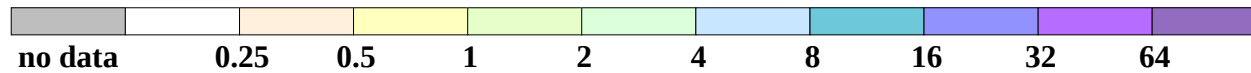
CSP Precipitation

Objectives

- Development of a global scale daily precipitation product based on existing multi-satellite estimates and bias-corrected precipitation gauge analyses.
- Improvement of the GPCP-1DD, 1 Degree Daily, global multi-satellite product due to calibration with global bias-corrected rain gauge analyses based on about 6 000 synoptic stations.

CSP Precipitation

01.07.2000



Precipitation [mm/d]

Source: GPCP-1DD

Statistics: mean = 2.71, rms = 6.98, std = 6.43, min = 0.00, max = 92.01

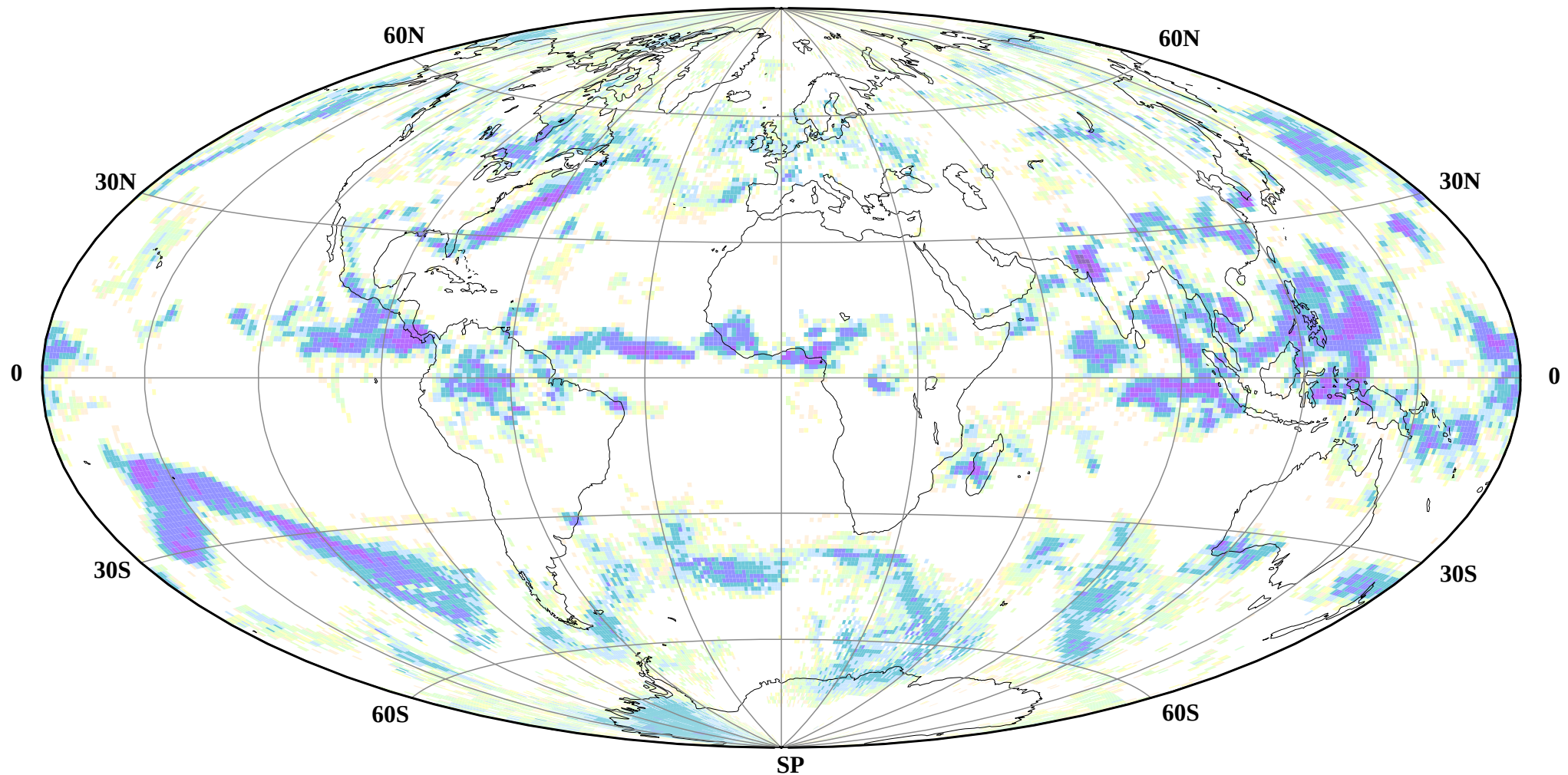


Fig. 1: GPCP-1DD multi-satellite estimates of precipitation for July 01, 2000.

CSP Precipitation

GPCP-1DD multi-satellite product

- Combination of different satellite estimates:
 - ★ IR estimates from geostationary satellites in the 40° N-S belt,
 - ★ rain estimates based on TOVS data from the polar orbiting satellites NOAA-12/14.
- Calibrated with monthly precipitation data being near-realtime available based SYNOP and CLIMAT reports from GPCC.

CSP Precipitation

Verification of the GPCP-1DD product

MAP mm/d	GPCP	ECMWF
≤ 1	0.04	0.40
1 - 2	0.25	0.42
2 - 3	0.27	0.44
3 - 4	0.34	0.48
4 - 5	0.38	0.56
5 - 6	0.40	0.53
> 6	0.45	0.59

Tab. 1:

True skill statistics (TSS, also known as Hanssen and Kuipers score: the probability of detection minus the probability of false detection) for GPCP-1DD and ECMWF precipitation products as function of analysed mean precipitation over the MAP model domain. The performance of the ECMWF t+6 to t+30 hour forecast is significantly higher. Period: June/July 1997. (Rubel and Rudolf 2001).

CSP Precipitation

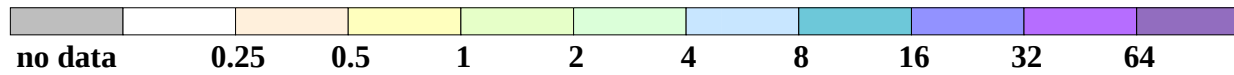
Methodology

- Collection of global daily rain gauge data based on about 6 000 synoptic stations for the period 1997 to present.
- Correction for systematic measurement errors (Ungersböck *et al.*, 2001) and interpolation to a global regular 1° longitude/latitude grid.
- Co-kriging of satellite and gauge measurements to calculate the final CSP precipitation product.



CSP Precipitation

01.07.2000



Precipitation [mm/d]

Source: GPCC bias corrected rain gauge data

Statistics: mean = 2.37, rms = 7.84, std = 7.48, min = 0.00, max = 157.00

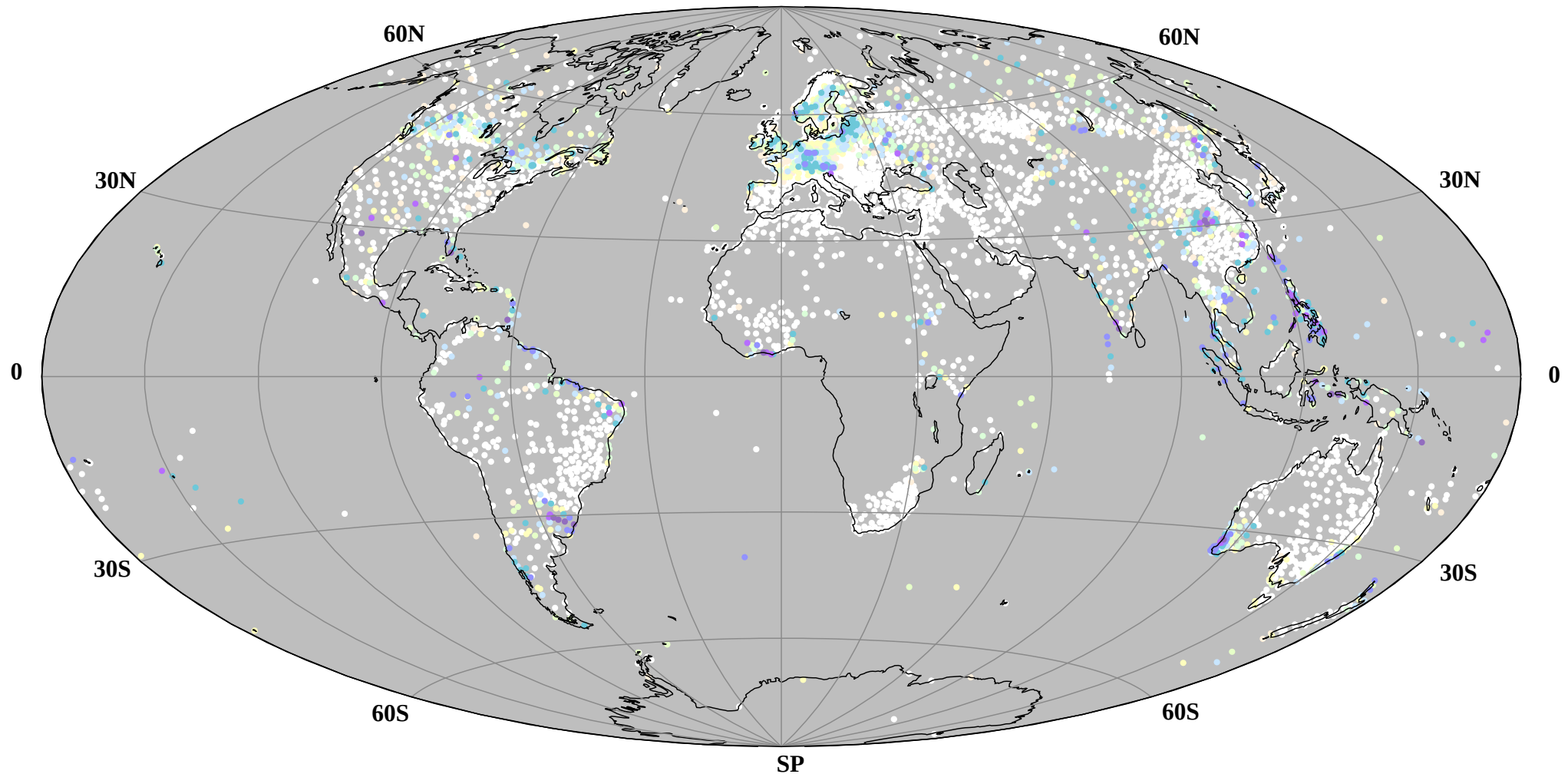


Fig. 2: GPCC bias-corrected rain gauge measurements for July 01, 2000.



CSP Precipitation

Users of CSP precipitation

- **CSP observatories:**

Natural Carbon Fluxes (ONC),

Food Security & Crop Monitoring (OFM).

- **Climate community:**

Global Precipitation Climatology Centre (GPCC),

Global Hydrology and Climate Center (GHCC),

etc.

CSP Precipitation

Timeline

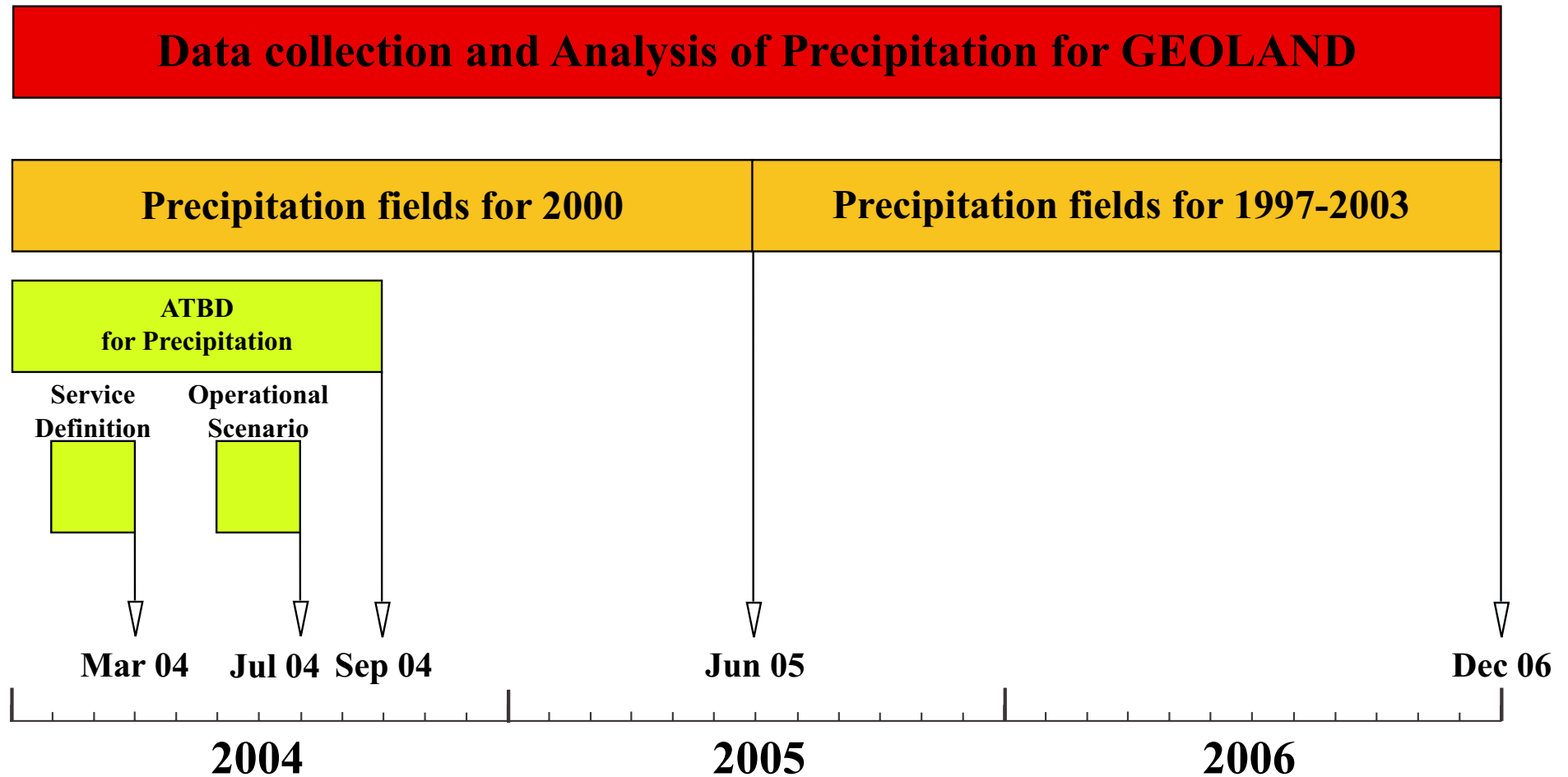


Fig. 3: Timeline for GEOLAND related precipitation analysis.

References

Rubel, F., P. Skomorowski, and B. Rudolf, 2002: Verification scores for the operational GPCP-1DD product over the European Alps. *Meteorol. Z.*, **11**, 367-370.

Rubel, F., and B. Rudolf, 2001: Global daily precipitation estimates proved over the European Alps. *Meteorol. Z.*, **10**, 403-414.

Ungersböck, M., F. Rubel, T. Fuchs and B. Rudolf, 2001: Bias correction of global daily rain gauge measurements. *Physics and Chemistry of the Earth (B)*, **26**, 411-414.

Thanks for your attendance!