Abstract

Precipitation is a central element in the global energy and water cycle. It is a sensitive parameter concerning climate change and climate variability. Monitoring precipitation is essential but not trivial. Already existing precipitation datasets do either lack of global coverage or do offer low spatial resolution. In the framework of EURO4M (European Reanalysis and Observations for Monitoring) a new precipitation dataset will be generated by trying to integrate satellite data over oceans (HOAPS) and rain-gauge data over land (GPCC). The new dataset will have almost global coverage, will span a time period of more than 20 years and will offer a spatial resolution of 0.5°. The EURO4M global precipitation dataset is intended to be suitable for climate monitoring.

Data basis for EURO4M-dataset

GPCC (Global Precipitation Climatology Centre)
- Part of GCOS (Global Climate Observation System) and WCRP (World Climate Research Programme)
- Lead by German Meteorological Service (DWD)
- Includes ~70000 rain-gauge stations from ~190 countries into a monthly dataset on a 0.5° grid
- Time period: 1901-2010

HOAPS (Hamburg Ocean Atmosphere Parameter and Fluxes from Satellites)
- Global precipitation and evaporation fields over ice-free ocean, using passive microwave measurements (SSM/I)
- Homogeneous and consistente time series
- Monthly, pentade and twice-daily precipitation data on 0.5° grid, currently from 1987 to 2005

Evaluation over ocean with PACRAIN data

PACRAIN (Pacific Rainfall Database) collects rainfall in a data-poor region, including data from atoll stations.

Comparisons of EURO4M precipitation

with GPCP (Global Precipitation Climatology Project)

Mean precipitation [mm/d] (1989 to 2005) of the preliminary EURO4M dataset with 0.5° resolution

Zonal means of precipitation [mm/d] (1989-2005), over ocean

Mean difference [mm/d] between EURO4M and GPCP

Zonal means of precipitation [mm/d] (1989-2005), over land

Mean precipitation [mm/d] (1989-2005) of GPCP

Zonal means of precipitation [mm/d] (1989-2005), over ocean

Mean difference [mm/d] between EURO4M and ERA-Interim

Zonal means of precipitation [mm/d] (1989-2005), over land

Mean precipitation [mm/d] (1989-2005) of ERA-Interim

Zonal means of precipitation [mm/d] (1989-2005), over ocean

References/ Acknowledgement

GPCP: http://precip.gsfc.nasa.gov, Huffman et al.
ERA-Reanalysis: www.ecmwf.int, Uppala et al.
HOAPS: www.hoaps.org, Andersson et al.
GPCC: http://gpcc.dwd.de, Pfeifroth et al.
PACRAIN: http://pacificrain.evac.ou.edu, Greene et al.

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