

Experimental GPCP Pentad (5-Day) Precipitation Analysis

1. Overview

An analysis of global pentad (5-day) precipitation has been constructed for the Global Precipitation Climatology Project (GPCP). It is created on a 2.5 degree latitude/longitude grid and covers a period from 1979 to near current time. This pentad analysis is a companion to the version 2.2 product of the GPCP global monthly precipitation analysis. Users are recommended to utilize the GPCP monthly analysis for applications of monthly and longer time scales and use this pentad data set only for studies where sub-monthly and intra-seasonal phenomena are involved.

2. Methodology

The GPCP pentad precipitation analysis is defined by merging several kinds of observation-based individual data sets, i.e., the GTS gauge observations and the estimates inferred from satellite observations of IR, OLR, MSU and SSM/I.

A three-step algorithm is adopted. First, to reduce the random error inherent in the individual data sources, the satellite estimates are combined linearly through the Maximum Likelihood Estimation method, in which the weighting coefficients are inversely proportional to the individual error variance.

To remove the bias, the output of the first step is then blended with the gauge data through the method of Reynolds (1988), in which the first-step output and the gauge data are used to define the 'shape' and the magnitude of the precipitation fields, respectively. Finally, the blended analysis is adjusted by the version 2.2 products of GPCP monthly precipitation analysis so that the accumulation of the pentad analysis matches that of the monthly analysis.

3. Products

Pentad GPCP Version 2.2 is defined by adjusting the pentad CMAP against the MONTHLY GPCP Version 2.2.

The current release of the GPCP pentad precipitation analysis is an experimental product and covers a period from pentad #1 of 1979 to pentad #11 of 2015.

The data set is composed of yearly files named as:

gpcp_pen_v2.2.sgi.yyyy

where yyyy is a 4-digital integer indicating the corresponding year (e.g. 1979 for the data file of the year 1979).

Each yearly file consists of 73 fields of pentad precipitation over the globe. Each global field is an array of 144 x 72 4-byte real numbers in big_endian byte order.

Starting from (1.25E; 88.75S), the global array goes from west to east and then from south to north in 2.5 degree latitude/longitude increment.

The pentad precipitation analysis values are output in units of mm/day with -999.0 indicating missing.

Below is a sample Fortran 77 program to read the pentad data set for 1979:

```
#####  
  
c    program      :    sample.f  
c    objective    :    sample program to read the pentad file for 1979  
  
    dimension    rain (144,72)  
c  
    open  (unit=10,  
#        file='gpcp_pen_v2.2.sgi.1979',  
#        access='direct',recl=144*72)  
  
    do 2001 kk = 1, 73  
        read  (10,rec=kk)  rain  
        write (6,2951)  kk,rain (72,36)  
2001 continue  
2951 format  (i8,f8.2)  
c  
    stop  
    end
```

#####

4. Contact Point

If you have any problems or questions concerning this pentad precipitation data set, please contact the data set creator at:

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