# SAFARI 2000 TRMM 3B-43 Monthly Precipitation, 1-Deg, 1999-2001

## Abstract

The purpose of the Tropical Rainfall Measuring Mission (TRMM) and TRMM Product 3B-43 is to provide a monthly, best-estimate precipitation rate and root-mean-square (RMS) precipitation error. These gridded estimates are on a one-calendar month temporal resolution and a 1-degree by 1-degree spatial resolution for the global band extending from 40 degrees south to 40 degrees north in latitude. Product 3B-43 combines two independent precipitation estimates, the daily-average adjusted GOES Precipitation Index (GPI) based on merged-infrared (IR) estimates (TRMM Product 3B-42) and the monthly accumulated Climate Assessment and Monitoring System (CAMS) or Global Precipitation Climatology Centre (GPCC) rain gauge analysis (TRMM Products 3A-45A and 3B-45B, respectively). During initial processing the CAMS data is used. During reprocessing, the GPCC data is used.

The data set prepared for SAFARI covers the years 1999, 2000, and 2001. The data files are stored as yearly files of monthly images. The monthly images are stored in a band sequential [BSQ] format (one image after the other) within the yearly files. The files for each year thus contain 12 monthly images per file.

## Background Information

**Investigators:**
George J. Huffman
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**Project:** TRMM

**Data Set Title:** Algorithm 3B43 - TRMM and Other Satellites Precipitation

**Site:** Southern Africa

**Westernmost Longitude:** 20° W
**Easternmost Longitude:** 50° E
**Northernmost Latitude:** 10° N
**Southernmost Latitude:** 50° S

**Data Set Citation:**

Huffman, G. J. and D. Bolvin. 2004. SAFARI 2000 TRMM 3B-43 Monthly Precipitation, 1-Deg, 1999-2001. Data set. Available on-line [http://www.daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A.

**NASA GSFC Laboratory for Atmosheres -- Global Precipitation Analysis:**
http://precip.gsfc.nasa.gov/ [Internet Link]

# Data File Information

The data files are stored as yearly files of monthly images. The monthly images are stored in a band sequential [BSQ] format (one image after the other) within the yearly files. The files for each year thus contain 12 monthly images per file. There may be some trailing bytes at the end of the monthly files, these are an artifact of the image processing system that produced the files and can be ignored.

   The annual files of 3B-43 data were provided by David Bolvin of the GSFC Mesoscale Atmospheric Processes Branch in a flat binary format. The global images were 360 sample by 180 line Real*4 images. The files were oriented with an upper left corner of 90 degrees North at the Prime Meridian. The yearly files were ingested into the PCI image processing package, where the Eastern and Western Hemispheres were switched so that the Prime Meridian was at the center of the images. Southern Africa subsets were then extracted from the global images at starting sample 161, starting line 81, with a size of 71 samples by 61 lines. Each image pixel is stored as a 4-byte real value of precipitation rate in units of millimeters. The data set prepared for SAFARI covers the years 1999, 2000, and 2001. Note that although the subset extraction extends to 50 degrees south for consistency, the 3B-43 data within the extractions extend only as far as 40 degrees south.

## Image Parameters

| | |
|---|---|
| Number of samples | 71 |
| Number of lines | 61 |
| Number of bands (months) per file | 12 |

| | |
|---|---|
| Bytes per pixel | 4 (REAL*4 big-endian) |
| Data Range | -99999 to ????? |
| Fill Value (missing or not valid) | -99999 |
| Data Units | millimeters |
| Pixel size | one degree by one degree |
| Projection | Cylindrical Equal Distance |

TRMM Product 3B-42 is produced at the day resolution, and uses TRMM-derived information to calibrate GPI based on merged-IR data. Coincident TRMM Combined Instrument (TCI; TRMM Product 2B-31) and Visible and Infrared Scanner (VIRS; TRMM Product 1B-01) data accumulated for a calendar month and used to form IR calibration parameters which are applied to the merged-IR data set. The result is a product with near-global coverage (high sampling) and the bias of the more accurate TCI data. These daily fields are summed over the calendar month and combined with the monthly rain gauge data using inverse error weighting to form TRMM Product 3B-43.

The current version of 3B-43 is Version 5. Version 6 will be released in Winter 2003. Significant changes to the algorithm will make Version 5 obsolete, so all Version 5 data should be replaced with Version 6.

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**References**

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