

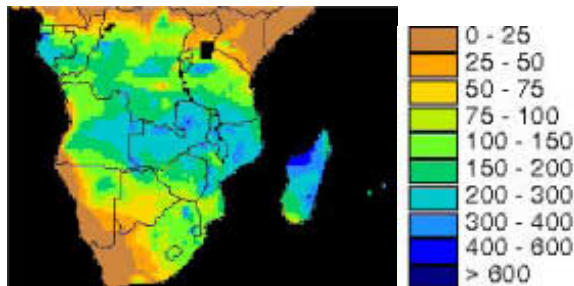
# SAFARI 2000 Mean Climatology, 0.5-Deg, 1930-1960, V. 2.1 (Cramer and Leemans)

## Summary:

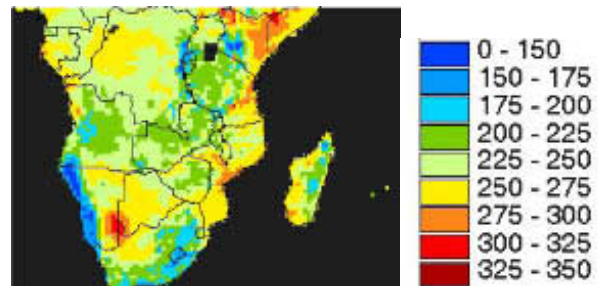
This data set is a subset of the global mean monthly climatology (Cramer and Leemans, 1999). The subset is for the area of southern Africa within the following bounds: 5N to 35S and 5E to 60E. The data are available in ASCII grid and binary image formats.

The parent database is a major update of the Leemans & Cramer database (Leemans & Cramer 1991). It contains long term monthly averages, for the period 1931-1960, of mean temperature, temperature range, precipitation, rain days and sunshine hours for the terrestrial surface of the globe, gridded at 0.5 degree longitude/latitude resolution. It was generated from a larger data base, using the partial thin-plate splining algorithm developed by Michael F. Hutchinson, Canberra (Hutchinson & Bischof 1983). The current version is 2.1 - this is the same version that is currently used widely around the globe, notably by all groups participating in the IGBP NPP model intercomparison.

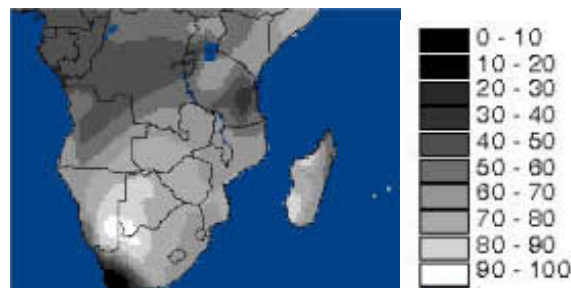
## Mean Climatology, 0.5-Deg, 1930-1960, V. 2.1, Southern Africa Subset



January Average Monthly Precipitation  
(mm/month)



January Average Monthly Surface Air Temperature  
(deg C x 10)



January Average Monthly Cloudiness  
(percent sunshine hours of potential hours per month)

## References

Cramer, W. P., and R. Leemans. 1999. Global 30-Year Mean Monthly Climatology, 1930-1960, V. 2.1 (Cramer and Leemans). Available on-line [<http://www.daac.ornl.gov/>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A.

Leemans, R. and W.P. Cramer, 1991. The IIASA database for mean monthly values of temperature, precipitation and cloudiness of a global terrestrial grid. Research Report RR-91-18 November 1991, International Institute of Applied Systems Analyses, Laxenburg. 61pp.

Hutchinson, M.F. & Bischof, R.J. 1983. A new method for estimating the spatial distribution of mean seasonal and annual rainfall applied to the Hunter Valley, New South Wales. *Austral. Met. Mag.* 31:179-184.

## Data Set Information:

This README file contains information regarding:

1. Data format
2. Procedure used to create the southern Africa subset
3. Legend and data source

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### Data File Information

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There are five gzipped tar files each containing twelve ASCII data files (.dat), and five gzipped tar file containing twelve binary image files (bsq) and twelve header files.

1. tmean --> average monthly surface air temperature (degrees C x 10)[2-byte signed images]tmean\_binary.tar.gz, tmean\_gridascii.tar.gz
2. precip --> average monthly precipitation (mm/month &ne; uncorrected for rain-gauge bias) [1-byte images] precip\_binary.tar.gz, precip\_gridascii.tar.gz
3. cloud --> average monthly cloudiness (% sunshine hours of potential hours per month) [1-byte images] cloud\_binary.tar.gz, cloud\_gridascii.tar.gz
4. tran --> average monthly temperature range (degrees C x 10) [see header files for file specific information] tran\_binary.tar.gz, tran\_gridascii.tar.gz
5. rd --> average number of rain days per month [1-byte images] rd\_binary.tar.gz, rd\_gridascii.tar.gz

Each of the tar files contains data files with the following naming convention:

var\_Ms.dat (or var\_Ms.bsq or var\_Ms.hdr)

where var is one of the following variable abbreviations:

tmean = temperature

precip = precipitation

cloud = cloudiness

tran = temperature range

rd = number of rain days

M is the month (1 through 12) and s signifies that it is a SAFARI subset.

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## ASCII File Information

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The data files are in ASCII Grid format for ArcInfo. Each file contains a single ASCII array with integer values. Coordinates listed below are in decimal degrees.

```
Rows 80
Columns 110
UpLeftX 5
UpLeftY 5
LoRightX 60
LoRightY -35
cellsize 0.5
Projection geographic
```

The ASCII file consists of header information containing a set of keywords, followed by cell values in row-major order. The file format is:

```
{NCOLS xxx}
{NROWS xxx}
{XLLCORNER xxx}
{YLLCORNER xxx}
{CELLSIZE xxx}
{NODATA_VALUE xxx}
row 1
row 2
...
row n
```

where xxx is a number, and the keyword NODATA\_VALUE is optional and defaults to -9999. Row 1 of the data is at the top of the grid, row 2 is just under row 1 and so on. The end of each row of data from the grid is terminated with a carriage return in the file.

To import this file into ArcInfo use the following command at an ARC prompt:

```
ASCIIGRID {in_ascii_file} {out_grid} {INT | FLOAT}
```

### Arguments:

```
{in_ascii_file} - the ASCII file to be converted.
{out_grid} - the name of the grid to be created.
{INT | FLOAT} - the data type of the output grid.
INT - an integer grid will be created.
FLOAT - a floating-point grid will be created.
```

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## Binary File Information

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The ASCII data files have also been converted into binary image files that can be viewed in any standard image viewing package. The files have an external header, 110 columns by 80 rows, and have the following number of bytes-per-pixel -- tmean (2-byte signed), precip (2-byte signed), cloud (1-byte), tran (1-byte or 2-byte signed - see

header files for image specific information), and rd (1-byte).

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#### Procedure Used to Create the Southern Africa Subset

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The original global data was used to create a point shapefile in ArcView. Since the lat/lon coordinates contained in the original data file represented the SW corner of each pixel, 0.25 was added to the latitude and to the longitude resulting in a coordinate pair representing the center of each pixel. The shapefile was converted into a point coverage in ARC/INFO using the SHAPEARC command. The point coverage was converted to an ARC/INFO grid using the POINTGRID command.

Using GRID (a raster- or cell-based geoprocessing toolbox that is integrated with ArcInfo) the SETWINDOW command was used to define the subarea of interest. This subarea was defined by identifying the bounding coordinates as follows:

```
x_min 5 y_min -35 x_max 60 y_max 5
```

The "snap\_grid" option of the SETWINDOW command was used. This snaps the lower-left corner of the specified window to the lower-left corner of the nearest cell in the snap\_grid and snaps the upper-right corner of the specified window to the upper-right corner of the nearest cell in the snap\_grid. In this case the snap\_grid is an original data grid. The purpose of this is to ensure the proper registration of the newly set analysis window. The command format used is as follows:

```
SETWINDOW x_min y_min x_max y_max original_grid
```

Once the window was set, creating the new grid was simply a matter of setting the new subset grid equal to the original grid.

```
subset_grid = original_grid
```

An ASCII array was created from the new subset grid using the GRID command GRIDASCII.

```
file.dat = GRIDASCII(subset_grid)
```

A band sequential binary image file and corresponding header file were generated using the ARC command GRIDIMAGE.

```
GRIDIMAGE subset_grid none file.bsq BSQ none
```

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#### Legend & Additional Sources of Information

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Temperature has units of degrees C x 10, -999 = water

Precipitation has units of mm/month, uncorrected for rain-gauge bias, -999 = water

Cloudiness has units of % sunshine hours of potential hours per month, 255 = water

Cramer, W. P., and R. Leemans. 1999. Global 30-Year Mean Monthly Climatology, 1930-1960, V. 2.1 (Cramer and Leemans). Available on-line [<http://www.daac.ornl.gov/>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A.

The original global version of the Leemans & Cramer IIASA Climate Database, 1991, is available on-line through

[NOAA's National Geophysical Data Center \(NGDC\) Global Ecosystems Database Version II \(GED\)](#).

Accompanying documentation and references may also be found at the GED website.