

# Brazilian Amazon Fire Frequency Data in Raster Format

## Summary:

This dataset contains fire frequency data for the subregion of the Brazilian Amazon. These data were converted to flat raster binary image files from the weekly fire count emails of Dr. Alberto Setzer (DSA/INPE at Cachoeira Paulista, Sao Paulo, Brazil) for the period of 1994-1997.

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## 1. Data Set Overview

### Data Set Identification:

Brazilian Amazon Fire Frequency Data in Raster Format

### Data Set Introduction:

This data set contains a) weekly cumulative fire counts, b) number of satellite images used in the week for each cell, and c) average number of pixels per image in each cell per week, in grid cells of 0.5 degrees of latitude by 0.5 degrees of longitude arranged in a matrix with 94 lines covering from 7 degrees North to 40 degrees South and 81 columns from 75 degrees West to 34.5 degrees West, from the emails of the AVHRR fire monitoring activity of Dr. Alberto Setzer (DSA/INPE at Cachoeira Paulista, São Paulo, Brazil). The original emails were converted into binary raster images by Peter Schlesinger (The Woods Hole Research Center, (WHRC)).

### Objective/Purpose:

These data are provided by WHRC and include pertinent map data in digital form. This data set has been processed to provide a raster file that can be used for modeling or for comparison purposes. The purpose of this data set is to provide information about vegetation fire frequency during the AVHRR fire monitoring season (June 1-November 30) in the region of the Brazilian Amazon.

### Summary of Parameters:

This data set contains information about vegetation fire counts in the Brazilian Amazon. The data set consists of three raster matrices of a) weekly cumulative fire counts, b) number of satellite images used in the week for each cell, and c) average number of pixels per image in each cell per week, in grid cells of 0.5 degrees of latitude by 0.5 degrees of longitude arranged in a matrix with 94 lines covering from 7 degrees North to 40 degrees South and 81 columns from 75 degrees West to 34.5 degrees West.

### Discussion:

The vegetation fire counts are made from the processing of AVHRR Channel 3. In years 1994-1996, only one AVHRR image was made available each day. In 1997 one afternoon NOAA-14 image and one early night NOAA-12 image are operationally processed every day. Consequently, this dataset consists of two sets of data, one from each satellite. It is likely that this will continue until sunglint precludes the use of NOAA-14 images, in mid-August. The data are produced by DSA/INPE at Cachoeira Paulista, São Paulo, Brazil, from AVHRR images of the NOAA satellites received and processed in real-time by the local HRPT station. Because the station is located at 22deg 41min South and 45deg West, the northern and western geographical parts of the above matrix are poorly covered. The satellite's orbit in relation to this site limits the coverage of images to the equator in the north, and to the state of Rondônia westward. INPE acquired an additional station that is being installed at Cuiabá, in the center of the country. The images from these two stations will then be combined in a mosaic fully covering the matrix area.

### Related Data Sets:

A map with a summary of the vegetation fires in the last AVHRR image processed by DSA/INPE can be found at: Latest [Vegetation Fire Image](http://condor.dsa.inpe.br/ult_focos.html) [http://condor.dsa.inpe.br/ult\\_focos.html](http://condor.dsa.inpe.br/ult_focos.html)

Maps of previous days are found at  
[Previous Vegetation Fire Images](http://condor.dsa.inpe.br/mapas_que) [http://condor.dsa.inpe.br/mapas\\_que](http://condor.dsa.inpe.br/mapas_que)  
after choosing the satellite pass of interest.

Daily information with geographical coordinates of each fire are also available at DSA/INPE and will be supplied with costs upon individual requests.

Maps of weekly and monthly fire distribution and data based on the INPE AVHRR processing, but produced by NMA/EMBRAPA from Campinas, Sao Paulo, Brazil, can be reached at:  
<http://www.nma.embrapa.br/projetos/qme/queimadas.html>

Cumulative monthly maps of fires are regularly published by "Climan E1lise", CPTEC/INPE's climate bulletin. Weekly maps are usually found in Saturday editions of the Brazilian newspaper "O Estado de S. Paulo".

## **2. Investigator(s)**

Investigator(s) Name and Title:

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Title of Investigation:

Brazilian Amazon Fire Frequency

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## **3. Theory of Measurements**

Not Available

## **4. Equipment**

Sensor/Instrument Description:

AVHRR Channel 3 (3.7 microns), NOAA 12 and NOAA 14

Collection Environment: Not Available

Source/Platform: Not Available

Source/Platform Mission Objectives: Not Available

Key Variables: Not Available

Principles of Operation: Not Available

Sensor/Instrument Measurement Geometry: Not Available

Manufacturer of Sensor/Instrument: Not Available

Calibration:

Specifications: Not Available

Tolerance: Not Available

Frequency of Calibration: Not Available

Other Calibration Information: Not Available

## 5. Data Acquisition Methods

The original dataset containing the matrices of fires were retrieved via FTP-anonymous at the following site: condor.dsa.inpe.br, directory: /pub/fires (in ASCII/gnuzipped files, ~65Kbytes/file).

## 6. Observations

Data Notes: Not Available

Field Notes: Not Available

## 7. Data Description

Spatial Characteristics:

Spatial Coverage:

From 7 degrees North to 40 degrees South and from 75 degrees West to 34.5 degrees West

Spatial Coverage Map: Not Available

Spatial Resolution:

Grid cells of 0.5 degrees of latitude by 0.5 degrees of longitude. 1km grid cell data may be available later in mid-autumn 1997.

Projection:

Geographic

Grid Description:

94 rows and 81 columns

Temporal Characteristics:

Temporal Coverage:

June 1 - November 30, 1994

June 1 - November 30, 1995

June 1 - November 30, 1996

June 1 - July 31, 1997

previous years and future dates may be available soon.

Temporal Coverage Map:

Not Available

Temporal Resolution: Not Available

Data Characteristics:

Parameter/Variable:

The data set consists of three raster matrices of:

- a) weekly cumulative fire count
- b) number of satellite images used in the week for each cell
- c) average number of pixels per image in each cell per week

Variable Description/Definition: Not Available

Unit of Measurement: Not Available

Data Source: Not Available

Data Range:

- a) byte 0-255
- b) byte 0-255
- c) real 0-1E37

Sample Data Record: Not Available

## 8. Data Organization

Data Granularity:

A general description of data granularity as it applies to the IMS appears in the EOSDIS Glossary.

Each of the 294 granules of this dataset consists of a single tarred and GNU-gzipped file. Each of the tarred and GNU-gzipped files in this dataset contains a single flat binary raster image file and an ASCII documentation file.

Data Format:

Each of the image data files in this set consists of 94 rows by 81 columns, comprising 15,228 bytes for the integer data files (in Intel-format 2-byte integers), and 38070 bytes for the real data files (in Intel-format 4-byte reals). There are no headers, trailers, or delimiters.

The structure of the ASCII documentation files is as follows (portions have been copied directly from the IDRISI for Windows v. 2.0 Help System, with the permission of the IDRISI Project, Clark University, Worcester, MA):

ITEM	DESCRIPTION
title	A descriptive name of the file.
data type	The type of numbers stored in the file. Allowable entries are byte, integer and real.
file type	The format in which the Image file is stored.
columns	The number of columns in the image.
rows	The number of rows in the image.
ref. system	The name of the geographic referencing system used with the file.
ref. units	The unit of measure used in the specified reference system. Allowable entries are m, ft, mi, km, deg and radians.
unit dist	The scaling factor between the given coordinates and actual measurements on the ground.

min X	The minimum X coordinate (left edge) of the image.
max X	The maximum X coordinate (right edge) of the image.
min Y	The minimum Y coordinate (bottom edge) of the image.
max Y	The maximum Y coordinate (top edge) of the image.
pos'n error	A measure of the accuracy of the positions in the image.
resolution	The inherent resolution of the image. In most cases, this should correspond to the result of dividing the range of reference coordinates in X by the number of columns in the image.
min value	The minimum value in the image.
max value	The maximum value in the image.
value units	The unit of measure of the values in the image. The term classes is used for all qualitative data sets, and that whenever standard linear units are appropriate, that the same abbreviations that are used for reference units should also be used (m, ft, mi, km, deg, rad).
value error	This field records the error in the data values that appear in image cells. For qualitative data, this should be recorded as a proportional error. For quantitative data, the value here should be an RMS error figure.
flag value	Any value in the image that is not a data value, but rather has a special meaning. If there is no flag value, this entry should remain blank.
flag def'n	Definition of the above flag value. The most common data flags are those used to indicate background cells and missing data cells.
legend cats	The number of legend categories present.
lineage	Description of the history by which the values were recorded/derived.
completeness	The degree to which the values describe the subject matter indicated.
consistency	The logical consistency of the file.

## 9. Data Manipulations

Formulae:

Derivation Techniques and Algorithms: Not Available

Data Processing Sequence:

Processing Steps: Not Available

Processing Changes: Not Available

Calculations:

Special Corrections/Adjustments: Not Available

Calculated Variables: Not Available

Graphs and Plots: Not Available

## 10. Errors

Sources of Error: Not Available

Quality Assessment:

Data Validation by Source: Not Available

Confidence Level/Accuracy Judgment: Not Available

Measurement Error for Parameters: Not Available

Additional Quality Assessments: Not Available

Data Verification by Data Center: Not Available

## 11. Notes

Limitations of the Data: Not Available

Known Problems with the Data: Not Available

Usage Guidance: Not Available

Any Other Relevant Information about the Study: Not Available

## 12. Application of the Data Set

Not Available

## 13. Future Modifications and Plans

Not Available

## 14. Software

Software Description:

Two softwares are required to read the files in this dataset:

the shareware tar program tar.exe

the GNU compression utility gzip.exe

Software Access:

The GNU-gzip program (gzip.exe) and shareware tar program (tar.exe) are available via Anonymous FTP from the following site: wuarchive.wustl.edu, in the directory, /systems/msdos/gnuish, files: gzip124x.zip and gnutar.zip

## 15. Data Access

Contact Information:

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Data Center Identification: Not Available

Procedures for Obtaining Data: Not Available

Data Center Status/Plans: Not Available

## 16. Output Products and Availability

Not Available

## 17. References

The material for this set of metadata were adapted largely and portions copied directly from a 1997 AVHRR fire monitoring season email document.

The source data for these images were the ASCII comma-delimited email notices of vegetation fire counts for 1994-1997 found at the Anonymous FTP address: condor.dsa.inpe.br, in the directory /pub/fires.

## 18. Glossary of Terms

Not Available

## 19. List of Acronyms

<b>Acronym</b>	<b>Definition</b>
ASCII	American Standard Code for Information Interchange
AVHRR	Advanced Very High Resolution Radiometer
CPTEC	Center for Weather Forecast and Climatic Studies
DSA	Division of Operation of Environmental Satellites
EMBRAPA	Brazilian Agricultural Research Corporation, of the Ministry of Agriculture and Food Supply
FTP	File Transfer Protocol
HRPT	High Resolution Picture Transmission
INPE	National Institute for Space Research
NMA	Nucleo de Monitoramento Ambiental e de Recursos Naturais por Satelite
NOAA	National Oceanic and Atmospheric Administration
WHRC	The Woods Hole Research Center

## 20. Document Information

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