

# LBA-ECO LC-02 GOES-08 Hot Pixel Data from Acre, Brazil: 1998, 2000, and 2001

## Summary:

This data set provides hot pixel data, as an indicator of fires that were detected by the GOES-8 satellite for the state of Acre, Brazil. Image data were collected for extended periods over the course of 3 years (1998, 2000 and 2001). Data were filtered to select only pixels identified and processed by the [GOES-8 Automated Biomass Burning Algorithm](#) (ABBA), where estimates of sub-pixel fire characteristics including size and temperature were able to be determined. There are three comma-delimited ASCII data files with this data set.

## Data Citation:

### Cite this data set as follows:

Selhorst, D. and I.F. Brown. 2012. LBA-ECO LC-02 GOES-08 Hot Pixel Data from Acre, Brazil: 1998, 2000, and 2001. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. <http://dx.doi.org/10.3334/ORNLDAAC/1092>

## Implementation of the LBA Data and Publication Policy by Data Users:

The LBA Data and Publication Policy [[http://daac.ornl.gov/LBA/lba\\_data\\_policy.html](http://daac.ornl.gov/LBA/lba_data_policy.html)] is in effect for a period of five (5) years from the date of archiving and should be followed by data users who have obtained LBA data sets from the ORNL DAAC. Users who download LBA data in the five years after data have been archived must contact the investigators who collected the data, per provisions 6 and 7 in the Policy.

This data set was archived in June of 2012. Users who download the data between June 2012 and May 2017 must comply with the LBA Data and Publication Policy.

Data users should use the Investigator contact information in this document to communicate with the data provider. Alternatively, the LBA website [<http://lba.inpa.gov.br/lba/>] in Brazil will have current contact information.

Data users should use the Data Set Citation and other applicable references provided in this document to acknowledge use of the data.

## Table of Contents:

- [1 Data Set Overview](#)
- [2 Data Characteristics](#)
- [3 Applications and Derivation](#)

- [4 Quality Assessment](#)
- [5 Acquisition Materials and Methods](#)
- [6 Data Access](#)
- [7 References](#)

## 1. Data Set Overview:

**Project:** LBA (Large-Scale Biosphere-Atmosphere Experiment in the Amazon)

**Activity:** LBA-ECO

**LBA Science Component:** Land Use and Land Cover

**Team ID:** LC-02 (Brown / Silveira / Esteves)

The investigators were Selhorst, Diogo and Brown, Irving Foster. You may contact Selhorst, Diogo (dselhorst@pop.com.br).

**LBA Data Set Inventory ID:** LC02\_GOES\_Hotpixel\_Acre

This data set provides hot pixel data, as an indicator of fires that were detected by the GOES-8 satellite for the state of Acre, Brazil. Image data were collected for extended periods over the course of 3 years (1998, 2000 and 2001). Data were filtered to select only pixels identified and processed by the GOES-8 Automated Biomass Burning Algorithm (ABBA), where estimates of sub-pixel fire characteristics including size and temperature were able to be determined.

### Related data sets

- [LBA-ECO LC-02 Hot Pixel Fire Indicator Data for Tri-national MAP Region: 2003-2006](#)
- [LBA-ECO LC-24 AVHRR DERIVED FIRE OCCURRENCE, 5-KM RESOLUTION, AMAZONIA: 2001](#)
- [LBA-ECO LC-23 CHARACTERIZATION OF VEGETATION FIRE DYNAMICS FOR BRAZIL: 2001-2003](#)

## 2. Data Characteristics:

Data are presented in three comma separated ASCII files:

**File 1:** GOES8\_Acre\_1998\_flag\_0.csv

**File 2:** GOES8\_Acre\_2000\_July-Oct\_flag\_0.csv

**File 3:** GOES8\_Acre\_2001\_Sep-Oct.csv

The files consists of information for active fires identified in GOES-8 multispectral imagery by the GOES-8 Automated Biomass Burning Algorithm (ABBA) at a specific time period for the years 1998, 2000, and 2001.

For all 3 data files, only pixels which were identified by ABBA as having sub-pixel fire characteristics, and were thus flagged as a "0", were included and analyzed.

Ecosystem types were based on the [Olson World Ecosystems database](#) (Olson 1992).

File name: GOES8\_Acre\_1998\_flag\_0.csv

Column	Heading	Units/format	Description
1	DATERANGE	yyddd-yyddd	Sampling year 1998 (yy) and day of year (ddd) range corresponding to sampling month
2	TIME	hhmm	Sampling time in UTC (local time = UTC-5)
3	Month	mmm	Sampling month (mmm)
4	Longitude	decimal degrees	Longitude of pixel location (- = west and + = east)
5	Latitude	decimal degrees	Latitude of pixel location (- = south and + = north)
6	SIZE	km2	Estimated fire size in square kilometers (km2)
7	TEMP_K	degrees K	Average fire temperature in degrees Kelvin (K)
8	ECOSYSTEM		Ecosystem type for pixel based on the Olson World Ecosystems Database

**Example data records:**

```
DATERANGE, TIME, Month, Longitude, Latitude, SIZE, TEMP, ECOSYSTEM
98213-98243, 1445, aug, -69.66, -8.66, 0,1668, 447, 33, 0
98213-98243, 1445, aug, -69.64, -8.68, 0,1295, 475, 33, 0
...
98274-98304, 2045, oct, -72.46, -7.76, 0,2050, 423, 33, 0
98274-98304, 2045, oct, -71.17, -8.06, 0,3179, 403, 33, 0
...
98244-98273, 2045, sep, -68.64, -11.12, 0,0397, 433, 29, 0
98244-98273, 2045, sep, -68.62, -11.12, 0,0502, 476, 29, 0
```

File name: GOES8\_Acre\_2000\_July-Oct\_flag\_0.csv

Column	Heading	Units/format	Description
1	Year	YYYY	Sampling year; 2000
2	Day	DDD	Day of the year sampled (184=July 2 through 301=Oct 27)
3	Time.UTC	HHMM	Sampling time in UTC (local time = UTC-5)
4	Longitude	decimal degrees	Longitude of pixel location (- = west and + = east)
5	Latitude	decimal degrees	Latitude of pixel location (- = south and + = north)
6	SIZE_KM2	km2	Estimated fire size in square kilometers (km2)
7	TEMP_K	degrees K	Average fire temperature in degrees Kelvin (K)
8	ECOSYSTEM		Ecosystem type for pixel based on the Olson World Ecosystems Database

**Example data records:**

```
Year,Day,Time_UTC,Longitude,Latitude,Fire_Area,Fire_Temp_K,Ecosystem
2000,275,1445,-67.33,-9.63,0.4095,407,29
2000,275,1445,-67.29,-9.63,0.2036,441,29
2000,275,1445,-67.33,-9.67,0.324,408,29
```

File name: **GOES8\_Acre\_2001\_Sep-Oct.csv**

Column	Heading	Units/format	Description
1	Year	YYYY	Sampling year; 2001
2	Day	DDD	Day of the year sampled (253=Sep 10 through 302=Oct 28)
3	Time_UTC	HHMM	Sampling time in UTC for fire product (local time = UTC-5)
4	Longitude	decimal degrees	Longitude of pixel location (- = west and + = east)
5	Latitude	decimal degrees	Latitude of pixel location (- = south and + = north)
6	T4_K	degrees k	3.9 micrometers band temperature in degrees Kelvin (K)
7	T11_K	degrees k	10.7 micrometers band temperature in degrees Kelvin (K)
8	SIZE_KM2	km2	Estimated fire size in square kilometers (km2)
9	TEMP_K	degrees k	Average fire temperature in degrees Kelvin (K)
10	ECOSYSTEM		Ecosystem type for pixel based on the Olson World Ecosystems Database

**Example data records:**

```
Year,Day,Time_UTC,Longitude,Latitude,T4_K,T11_K,SIZE_KM2,TEMP_K,ECOSYSTEM
2001,253,1415,-67.35,-10.01,311,7,299,2,0,0379,490,29
2001,253,1415,-68.4,-9.44,"317,1,"297,0,0,1175,497,58
...
2001,266,1445,-68.17,-10.23,312,3,299,1,0,0926,465,29
2001,266,1445,-67.88,-10.6,"313,7,"297,3,0,1439,454,29
...
2001,300,1945,-68.39,-10.71,313,8,295,3,0,0876,492,29
2001,302,1745,-67.35,-9.75,"315,2,295,0,0,0054,758,29
```

**Site boundaries:** (All latitude and longitude given in decimal degrees)

Site (Region)	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude	Geodetic Datum
Acre - Parque Zoobotanico (Acre)	-67.87	-67.87	-9.95	-9.95	South-American Datum, 1969 (SAD-69)

**Time period:**

- The data set covers the period 1998/08/01 to 2001/10/30.
- Temporal Resolution:  
1998: 4 times per day

2000: 8 times per day  
2001: 48 times per day

**Platform/Sensor/Parameters measured include:**

- GOES-8 (GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE-8) / GOES-8 IMAGER / FIRES

### **3. Data Application and Derivation:**

Comparison of fire data from the GOES-8 products to other satellite image products, videography as well as records of official permits for deforestation and controlled burning, can help to determine which approach gives the most accurate assessment of actual activity at various spatial and temporal scales.

### **4. Quality Assessment:**

Data were filtered to select only pixels flagged by GOES-8 Automated Biomass Burning Algorithm (ABBA) as 0, where estimates of sub-pixel fire characteristics including size and temperature were able to be determined. Pixels flagged with values of 1-3, which represented fires but were contaminated by saturation or clouds, were excluded from the data set. Estimates of fire frequency are considered to be conservative due to the exclusion of pixels contaminated by cloud cover or saturation (high reflectivity) and probably represent on the order of half to one tenth of the actual fire activity.

### **5. Data Acquisition Materials and Methods:**

We collected data on fires from GOES-8 satellite images for the state of Acre, Brazil, for extended periods over the course of 3 years (1998, 2000 and 2001).

The GOES-8 satellite used 2 infra-red windows (3.9 micrometers and 10.7 micrometers) to detect fires with a spatial resolution of 4 km (nadir). Due to its geostationary orbit its coverage includes most of South America. In 1998 there were 4 sampling points daily at 00:15, 6:15, 12:15 and 18:15 UTC (Local time is UTC-5). In 2000 there were 8 sampling points daily (02:45, 05:45, 18:45, 11:45, 14:45, 17:45, 20:45 and 23:45 UTC), and in 2001 sampling was done every half hour.

Temperatures for 1998 and 2000 data were determined using ABBA (Automated Biomass Burning Algorithm) developed by CIMSS at the University of Wisconsin. Temperatures for two infrared windows were determined for 2001 data using WFABBA ([Wild Fire Automated Biomass Burning Algorithm](#)) also developed by CIMSS/UW-Madison, which has better spatial and temporal resolution as well as improved handling of data contaminated by clouds or saturation (Prins et al., 2001).

Data from all three years were filtered to select only pixels identified and processed by the GOES-8 ABBA, where estimates of sub-pixel fire characteristics including size and temperature were able to be determined and the points were flagged as 0. Other pixels that potentially represented fires but were contaminated by saturation or clouds were excluded from the analyses.

### **6. Data Access:**

This data is available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

## **Data Archive Center:**

### **Contact for Data Center Access Information:**

E-mail: [uso@daac.ornl.gov](mailto:uso@daac.ornl.gov)

Telephone: +1 (865) 241-3952

## **7. References:**

Olson, J.S. 1992. World Ecosystems (WE1.4). Digital Raster Data on a 10-minute Cartesian Orthogonal Geodetic 1080x2160 grid. In: Global Ecosystems Database, Version 2.0. Boulder, CO: National Geophysical Data Center.

Prins E.M. et al. 2001. An overview of diurnal active fire monitoring using a suite of international geostationary satellites. Global and Regional Vegetation Fire Monitoring from Space: Planning a Coordinated International Effort. p 145-170. Academic Publishing, The Hague, The Netherlands.

### **Related Publications**

- Selhorst, D; Brown, I.F. 2003. Queimadas na Amazonia Sul-Occidental, Estado do Acre - Brasil: Comparacao entre produtos de satelites (GOES-8 E NOAA-12) e observacoes de campo. Anais XI SBSR, Belo Horizonte, Brasil, 05 -10 abril 2003, INPE, p. 517-524.