

# LBA-ECO LC-24 Landsat TM and ETM+ Land Cover, Southern Para, Brazil: 1984-2003

## Summary:

This data set is a five-class land cover for Southern Para for the years 1984 (Landsat MSS), 1988 (Landsat TM), 1996, and 2003 (Landsat ETM+). The final classification shows five classes derived using visual comparison (Water, Clouds/Shadow, Forest, Not Forest, Background). These data were used in 2007 to illustrate the nature of deforestation in Southern Para, Brazil over the past twenty years (Simmons et al. 2007). There are four annual GeoTIFF files distributed with this data set. Each GeoTIFF file and accompanying \*.fw file have been compressed into a single \*.zip file.

## Data Citation:

**Cite this data set as follows:**

Simmons, C.S., M.M. Caldas, E.Y. Arima, and S.P. Aldrich. 2011. LBA-ECO LC-24 Landsat TM and ETM+ Land Cover, Southern Para, Brazil: 1984-2003. Data set. Available on-line [<http://daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. [doi:10.3334/ORNLDAAC/1055](https://doi.org/10.3334/ORNLDAAC/1055)

## 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 Users who download LBA data in the five years after data have been archived must contact the investigators who collected the data, per provisions 6 and 7 in the Policy.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 December of 2011. Users who download the data between December 2011 and November 2016 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 Web Site [<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:** Human Dimensions

**Team ID:** LC-24 (Walker / Reis)

The investigators were Walker, Robert T.; Reis, Eustaquio J; Arima, Eugenio; Bohrer, Claudio Belmonte de Athayde; Caldas, Marcellus Marques; Perz, Stephen G; Pfaff, Alexander; Qi, Jianguo and Souza Jr., Carlos Moreira de. You may contact Walker, Robert T. (rwalker@msu.edu).

**LBA Data Set Inventory ID:** LC24\_Land\_Cover\_Southern\_Para

This data set is a five-class land cover for Southern Para for the years 1984 (Landsat MSS), 1988 (Landsat TM), 1996, and 2003 (Landsat ETM+). The classification shows five classes using visual comparison (Water, Clouds/Shadow, Forest, Not Forest, Background). These data were used in 2007 to illustrate the nature of deforestation in Southern Para, Brazil over the past twenty years. The data show similar trends on many of the more than 100 official settlement-projects in the region that have been established by the government land-reform agency.

### Related Data Sets:

- [LBA-ECO LC-24 Land Cover Classes from Landsat TM, Uruara, Para: 1986-1991](#)
- [LBA-ECO LC-24 Forest Cover Map from MODIS, 500-m, South America: 2001](#)
- [LBA-ECO LC-24 Cadastral Property Map of Uruara, Para, Brazil: ca.1975](#)

## 2. Data Characteristics:

The 1984 Landsat MSS scene was acquired from the University of Maryland's Global Land Cover Facility in a pre-processed form and was co-registered with the more accurate 2003 imagery (using 10 ground-control points collected in the Summer of 2006). Landsat TM and ETM scenes were acquired from TRFIC and Landsat.org and were coregistered to the 2003 imagery. There are four annual GeoTIFF files distributed with this data set. Each GeoTIFF file and accompanying \*.tfw file have been compressed into a single \*.zip file.

There are four images:

sparalc1984.zip  
sparalc1988.zip  
sparalc1996.zip  
sparalc2003.zip

**Spatial Extent:**

1984

Westernmost Longitude -49.84348792  
Easternmost Longitude -19.84348792  
Northernmost Latitude -4.826398266  
Southernmost Latitude -34.82639827

1988

Westernmost Longitude -49.9271301  
Easternmost Longitude -19.9271301  
Northernmost Latitude -4.790768647  
Southernmost Latitude -34.79076865

1996

Westernmost Longitude -49.85991435  
Easternmost Longitude -19.85991435  
Northernmost Latitude -4.870740649  
Southernmost Latitude -34.87074065

2003

Westernmost Longitude -49.93847795  
Easternmost Longitude -49.93847795  
Northernmost Latitude -4.798870611  
Southernmost Latitude -34.79887061

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

Site (Region)	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude	Geodetic Datum
Southern Para	-49.9385	-19.84348792	-4.790768647	-34.87074065	South-American Datum, 1969 (SAD-69)

**Time period:**

- The data set covers the period: 1984, 1988, 1996, and 2003
- Temporal Resolution: every 4 to 6 years

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

- LANDSAT-5 / LANDSAT TM (LANDSAT THEMATIC MAPPER) / LAND COVER
- LANDSAT-7 / LANDSAT ETM+ / LAND COVER
- FIELD INVESTIGATION / HUMAN OBSERVER / SOCIAL BEHAVIOR
- LANDSAT-7 / ETM+ (ENHANCED THEMATIC MAPPER PLUS) / LAND USE CLASSES

### 3. Data Application and Derivation:

The data have been used to illustrate the nature of deforestation in Southern Para over the past twenty years. Especially of interest is deforestation associated with the establishment of new smallholder agricultural settlements (Simmons et al. 2007).

## 4. Quality Assessment:

No formal accuracy assessment has been undertaken with regard to attribution. It is possible, indeed, likely, that there are errors of commission and omission in the resulting classification. Spatial accuracy after georectification of the 1984 scene was good, RMSE less than 0.8.

## 5. Data Acquisition Materials and Methods:

This data is a k-means classification of rough land-cover for Southern Para for the years 1984 (Landsat MSS), 1988 (Landsat TM), 1996, and 2003 (Landsat ETM+). The classification was developed on 20 classes separated out over a maximum of 500 iterations of the k-means algorithm. The resulting 20 classes were collapsed into five classes using visual comparison (Water, Clouds/Shadow, Forest, Not Forest, Background).

The 1984 Landsat MSS scene was acquired from the University of Maryland's Global Land Cover Facility in a pre-processed form and was co-registered with the more accurate 2003 imagery (using 10 ground-control points collected in the Summer of 2006). Landsat TM and ETM scenes were acquired from TRFIC and Landsat.org and were coregistered to the 2003 imagery.

## 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:

Simmons, C.S, R.T. Walker, M.M. Caldas, E.Y. Arima, and S.P. Aldrich. 2007. Amazon Land Wars in the South of Para. *Annals of the Association of American Geographers*: 97 (3).