LBA-ECO LC-01 Landsat MSS, TM, ETM+ Imagery, Northern Ecuadorian Amazon: 1973-2002

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Revision date: September 5, 2013

Summary:

This data set contains a time series of early Landsat-4 MSS satellite imagery as well as Landsat-5 TM and Landsat-7 ETM+ satellite imagery of the northern Ecuadorian Amazon. Some of the TM and ETM images have been georectified to UTM Zone 18 South, WGS84 Datum. Not all of the images have been georectified.

There are 16 GeoTIFF (.tiff) images provided in eight compressed (*.zip) files with this data set. When expanded, the .zip files provide the image files and corresponding header (.hdr) files with band and projection information.

Data Citation:

Cite this data set as follows:

Walsh, S.J., R.E. Bilsborrow, and B.G. Frizzelle. 2013. LBA-ECO LC-01 Landsat MSS, TM, ETM+ Imagery, Northern Ecuadorian Amazon: 1973-2002. Data set. Available on-line [http://daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. http://dx.doi.org/10.3334/ORNLDAAC/1187

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] 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 Users who download LBA data in the five years after data have been archived must contact the investigators who collected the data, per provisions 6 and 7 in the Policy.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 September of 2013. Users who download the data between September 2013 and August 2018 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.

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

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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-01 (Bilsborrow / Walsh / Garcia)

The investigators were Bilsborrow, Richard E.; Walsh, Stephen J. and McGregor, Stephen J. . You may contact Walsh, Stephen J. (swalsh@email.unc.edu) ; Bilsborrow, Richard E. (richard_bilsborrow@unc.edu) and Frizzelle, Brian G. (bgf@email.unc.edu).

LBA Data Set Inventory ID: LC01_Landsat

This data set contains a time series of early Landsat-4 MSS satellite imagery as well as Landsat-5 TM and Landsat-7 ETM satellite imagery of the northern Ecuadorian Amazon. Some of the TM and ETM images have been georectified to UTM Zone 18 South, WGS84 Datum. Not all of the images have been georectified.

Related Data Sets:

- LBA-ECO LC-01 Hydrography, Morphology, Edaphology, Northern Ecuadorian Amazon (Hydrographic, morphologic and edaphologic features in the northern Ecuadorian Amazon)
- LBA-ECO LC-01 Topographic Data for Intensive Study Areas, Northern Ecuadorian Amazon (Topographic data from the 4 intensive study areas located in the northern Ecuadorian Amazon region)
- LBA-ECO LC-01 Citiy, Community, and Road Maps, Northern Ecuadorian Amazon: 1990-2002 (Same study area)
- LBA-ECO LC-01 National, Provincial, and Park Boundaries, Ecuador: 1998-2001 (Same study area)

2. Data Characteristics:

There are 16 GeoTIFF (.tiff) images and corresponding header files (.hdr) provided in eight compressed (*.zip) files with this data set. The header files provide band and projection information.

The zip file names and GeoTIFF file names reflect the Landsat **p**ath**/r**ow_ Landsat-4 **MSS** satellite imagery **or** Landsat-5 **TM** _**date.**

File names:

Zip File Names	Image File Names (.tif)	Sensor	Raw or Rectified
p9r60_mss_07feb73.zip	p9/r60_mss_07feb73.tif	MSS	raw
p9r60_tm_07aug89.zip	p9/r60_tm_07aug89.tif	TM	rectified
p9r60_tm_09nov00.zip	p9r60_tm_09nov00_pan.tif p9r60_tm_09nov00_tir.tif p9r60_tm_09nov00_vir.tif	ETM+	raw
p9r60_tm_12sep02.zip	p9r60_tm_12sep02_pan.tif p9r60_tm_12sep02_tir.tif p9r60_tm_12sep02_vir.tif	ETM+	raw
p9r60_tm_15nov99.zip	p9r60_tm_15nov99.tif	TM	rectified
p9r60_tm_19oct95.zip	p9r60_tm_19oct95.tif	TM	rectified
p9r60_tm_24aug01.zip	p9r60_tm_24aug01_pan.tif p9r60_tm_24aug01_tir.tif p9r60_tm_24aug01_vir.tif	ETM+	raw
p9r60_tm_9sep01.zip	p9r60_tm_9sep01_pan.tif p9r60_tm_9sep01_vir.tif p9r60_tm_9sep01_tir.tif	ETM+	raw

Files with _**pan** before the file extension represent Landsat 7 panochromatic band 8**,** _**tir** represents Landsat 7 thermal infrared bands 6.1 and 6.2, and _**vir** represents Landsat 7 visible and near infrared bands 1-5 and 7.

MSS Imagery

Spatial coverage: Path/Row (P/R) -scenes dates (YYYYMMDD) for images.

P9R60 - 19730207 (Full image has not been rectified. The East ISA subset has been rectified.)

Spatial resolution:

Bands 1-4: 79 meters

Band 5: 240 meters

Projection (for imagery that has been georectified): Universal Transverse Mercator, Zone 18S

TM/ETM Imagery

Spatial coverage: Path/Row (p/r) -scenes and dates (YYYYMMDD) for the rectified and raw images.

RECTIFIED: p9r60 - 19890807, 19991115, 20020912

RAW: p9r60 - 20001109, 20010824, 20010909

Spatial resolution:

Bands 1-5 & 7 : 30 meters

Band 6: 120 meters

Projection (for imagery that has been georectified): Universal Transverse Mercator, Zone 18S

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

Site (Region)	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude	Geodetic Datum
Northern Ecuadorian Amazon (Ecuador)	-78.28307	-74.40062	0.94955	-2.39793	World Geodetic System, 1984 (WGS-84)

Time period:

- The data set covers the period: 1973/02/07 to 2002/09/12
- Temporal Resolution: one image for 1973, 1989, 1999, 2000, 2002, and two images from 2001.

Platform/Sensor/Parameters measured include:

- LANDSAT-4 (LAND REMOTE-SENSING SATELLITE-4) / MSS (MULTISPECTRAL SCANNER) / LAND COVER
- LANDSAT-5 (LAND REMOTE-SENSING SATELLITE-5) / LANDSAT TM (LANDSAT THEMATIC MAPPER) / REFLECTANCE
- LANDSAT-7 (LAND REMOTE-SENSING SATELLITE-7) / LANDSAT ETM+ / REFLECTANCE

3. Data Application and Derivation:

Typical application of the data: These images may be used cartographically, as base data upon which other spatial data layers are displayed. Additionally, the data may be used to derive LULC classifications that may be used to calculate deforestation rates or pattern metrics, as well as to produce change detections.

Derivation techniques: NA; these datasets are the original imagery, from which classifications were derived.

4. Quality Assessment:

Horizontal Accuracy: MSS Images that have been geo-rectified all have a horizontal accuracy of plus or minus 40 meters. TM images that have been geo-rectified all have a horizontal accuracy of plus or minus 15 meters. Those images that have not been rectified have no quantifiable horizontal accuracy.

5. Data Acquisition Materials and Methods:

Site description

The Northeastern Ecuadorian Amazon is significant from social, biophysical, and geographical bases, with complex terrain and landuse/landchange variability. The western Amazon region, bordering the Andes and lying at the headwaters of the Amazon River basin, possesses several major centers of endemism, including the Napo. Settlers in the Napo and Sucumbios provinces, the two dominant Cantons or States, settled on 50 ha plots, clearing primary forest to grow subsistence crops, coffee, and for pasturage. The annual precipitation is high (2,800 mm/year), so there is no distinct dry season. Despite the region's global biodiversity and carbon sequestration significance, agricultural settlement and consequent deforestation threaten the region (Messina and Walsh, 2001).

Data Acquisition

MSS Data acquisition methods: All scenes were acquired from NASA's Earth Observing System (EOS).

TM Data acquisition methods: All scenes were acquired from EOS, with the exception of two scenes acquired from CLIRSEN (Centro de Levantamientos Integrados de Recursos Naturales por Sensores Remotos) in Ecuador.

7. References:

Messina, J.P. and S.J. Walsh. 2001. 2.5D Morphogenesis: Modeling Landuse and Landcover Dynamics in the Ecuadorian Amazon. Plant Ecology, 156 (1): 75-88.

Related Publications

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- Rindfuss RR, Walsh SJ, Mishra V, Fox J, Dolcemascolo GP. (2003) Linking Households and Remotely Sensed Data: Methodological and Practical Problems. In Linking Household and Remotely Sensed Data: Methodological and Practical Problems (eds J. Fox, V. Mishra, R.R. Rindfuss & S.J.

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