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Data

LBA-ECO LC-15 NDVI Composite Images of the Amazon Basin: 1999-2000

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Revision Date: August 7, 2014

Summary

This data set provides Normalized Difference Vegetation Index (NDVI) composite images of the Amazon Basin for the years 1999-2000 at approximately1-km spatial resolution. The images were from the VEGETATION 1 sensor, aboard the SPOT 4 satellite.

Ten day composite images were reprocessed through several filters for cloud removal. Monthly NDVI data were used to create five metrics: maximum NDVI, minimum of 6 greenest months, range of NDVI between min and max, mean NDVI dry months, and mean NDVI wet months.

There are five GeoTIFF (.tif) files with this data set.

Data Citation:

Cite this data set as follows:

Saatchi, S., M. Steinenger, C.J. Tucker, B. Nelson, and M. Simard. 2014. LBA-ECO LC-15 NDVI Composite Images of the Amazon Basin: 1999-2000. 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/1239

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 Users who download LBA data in the five years after data have been archived must contact the investigators who collected the data, per provisions 6 and 7 in the Policy.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 August 2014. Users who download the data between August 2014 and September 2019 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.

Table of Contents:

1. Data Set Overview:

Project: LBA-ECO

Activity: Regional Vegetation Variables

LBA Science Component: Land Use and Land Cover

Team ID: LC-15 (Saatchi / Alvala)

The investigator was Dr. Sassan S.Saatchi. You may contact Dr Saatchi at (Saatchi@congo.jpl.nasa.gov).

LBA Data Set Inventory ID: LC15_SPOT_Metrics

This data set provides Normalized Difference Vegetation Index (NDVI) composite images for the Amazon Basin for the years 1999-2000. The images were from the VEGETATION 1 sensor, aboard the SPOT 4 satellite. Ten day composites NDVI image data covering the Amazon basin for two years were reprocessed through several filters for cloud removal and monthly NDVI data were used to create five metrics: maximum NDVI, minimum of 6 greenest months, range of NDVI between min and max, mean NDVI dry months, and mean NDVI wet months.

2. Data Characteristics:

There are five GeoTIFF (.tif) files of NDVI composite images at approximately 1-km spatial resolution. The images depict Maximum NDVI, Minimum of 6 greenest months, Range of NDVI between Min and Max, Mean NDVI Dry Months, and Mean NDVI Wet Months.

Each file contains one NDVI metric indicated by number in the file name:

1. amazon_ndvi_metric1.tif: Maximum NDVI
2. amazon_ndvi_metric2.tif: Minimum NDVI of 6 greenest months
3. amazon_ndvi_metric3.tif: Range of NDVI between Min and Max
4. amazon_ndvi_metric4.tif: Mean NDVI Dry Months
5. amazon_ndvi_metric5.tif: Mean NDVI Wet Months

Spatial Data Properties

Spatial Representation Type: Raster
Pixel Depth: 8 bit
Pixel Type: unsigned integer
Compression Type: LZW
Number of Bands: 1
Band Information: Landsat Band
Raster Format: TIFF
Source Type: continuous
No Data Value: none
Scale Factor: none
Offset: none

Number Columns: 5900
Column Resolution: 0.00833 degrees
Number Rows: 4200
Row Resolution: 0.00833 degrees

Extent in the items coordinate system
North: 13.8583
South: -21.1277
West: -82.7209
East: -33.5739

Cell Geometry: area
Point in Pixel: center

Spatial Reference Properties

Type: Geographic
Geographic Coordinate Reference: GCS_WGS_1984
Datum: D_WGS_1984

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

Site (Region)	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude	Geodetic Datum
Amazon Basin	-82.72083	-33.5739	13.8583	-21.1277	World Geodetic System, 1984 (WGS-84)

Time period:

- The data set covers the period: 1999/01/01 to 2000/12/30
- Temporal Resolution: 10-day composite NDVI images

Platform/Sensor/Parameters measured include:

- SPOT (SYSTEME PROBATOIRE POUR L'OBSERVATION DE LA TERRE) / IMAGING RADIOMETERS / VEGETATION INDEX
- SPOT (SYSTEME PROBATOIRE POUR L'OBSERVATION DE LA TERRE) / IMAGING RADIOMETERS / VEGETATION COVER

3. Data Application and Derivation:

Incorporating remote sensing data from several sensors responding to various attributes of land cover, commonly referred to as data fusion is one way to improve current land classifications in the tropics. These NDVI data, in combination with radar data from the JERS-1 satellite, were used in a test of a data fusion approach for the Amazon Basin land cover mapping.

4. Quality Assessment:

The standard correction method for all VEGETATION products is based on SMAC (Simplified Method for Atmospheric Correction) with the aerosol optical depth at 550 nm and the vertically integrated gaseous contents for water vapor and ozone (Rahman and Dedieu, 1994). The ground surface reflectance was then used to calculate the NDVI for each pixel. The 10-day composite images were used to obtain the monthly NDVI images based on the maximum-NDVI criterion. To further reduce potential cloud contamination, monthly maximum NDVI images from April, 1998 through March, 2001 were used to calculate monthly mean NDVI over a 3-year period. The final monthly NDVI time series was further processed to eliminate any outliers using the Fourier-based adjustment technique (Los, 1998).

5. Data Acquisition Materials and Methods:

Two years of approximately 1-km NDVI data were obtained from SPOT VEGETATION. The VEGETATION 1 sensor is aboard the SPOT 4 satellite launched on 24 March 1998. The sensor provides daily 1-km resolution images of nearly all of the terrestrial earth, with 2,250-km swath, 101 degrees field of view, and four spectral channels: blue (0.43-0.47 mm), red (0.61-0.68 mm), near infrared (0.78-0.89 mm), and middle infrared (1.58-1.75 mm). The radiometric resolution of surface reflectance is from 0.001 to 0.003 with different adjustments for each band. All pixels are resampled onto a regular grid by taking into account the spectral band registration, satellite location and attitude correction, and parallax distortion caused by terrain elevation.

The 10-day composite was obtained by choosing the best measurement of the period that met the following criteria:

- did not correspond to a blind or interpolated pixel
- was not flagged as cloudy in the status map
- corresponded to the highest value of Top of Atmosphere NDVI.

6. Data Access:

These data are 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
Telephone: +1 (865) 241-3952

7. References:

Hansen, M.C., R. DeFries, and J. Townshend. (2000). Global land cover classification at 1 km spatial resolution using classification tree. International Journal of Remote Sensing, 21, 1331-1364.

Los, S.O. (1998). Linkages Between Global Vegetation and Climate: An Analysis Based on NOAA Advanced Very High Resolution Radiometer Data. PhD. Dissertation, Vrije Universiteit, NASA/GSFC/CR-1998-206852.

Rahman, H. and G. Dedieu. (1994). SMAC: A Simplified Method of Atmospheric Correction of satellite measurements in the solar spectrum. International Journal of Remote Sensing, 15, 123-143.

TRFIC (2002). Tropical Rain Forest Information Center. http://bsrsi.msu.edu/trfic/.

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Newsletters
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Products
Product Overview
Field Campaigns
Validation
Regional/Global
Model Archive

Data
Complete Data Set List
Search for Data
Field Campaigns
Validation
Regional/Global
Model Archive

Tools
Data Search
Site Search
Search by DOI
WebGIS
SDAT
MODIS Land Subsets
THREDDS

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FAQs
Tutorials
Data Management

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