1. SPOT VEGETATION Subsets

SPOT VEGETATION Normalized Difference Vegetation Index (NDVI), from mid-1998 to mid-2004.

NDVI is the difference between the near-infrared and visible bands divided by the sum of these two bands (Tucker 1980; Sellers 1985; Sellers et al. 1994).

Subsets of Earth Observation System (EOS) and Land Product Validation (LPV) Core Sites were processed and extracted by the Global Inventory Modeling and Mapping Studies (GIMMS) group at Goddard Space Flight Center (GSFC). The data have been provided by the United States Department of Agriculture (USDA)/Foreign Agricultural Service (FAS) through collaboration with the GIMMS Group. The continental data were downloaded from Processing and Archiving Image Center, hosted by Vito, the Flemish Institute for Technological Research, located in Mol/ Belgium.

More information about the SPOT VEGETATION sensor and products can be found at the following web sites:
http://www.spot-vegetation.com/
http://www.vgt.vito.be/faq/faq.html

A detailed user guide to the VEGETATION data is available.
Online:
http://www.spot-vegetation.com/vegetationprogramme/Pages/TheVegetationSystem/userguide/userguide.htm

Download:
http://www.spot-vegetation.com/vegetationprogramme/Pages/TheVegetationSystem/userguide/userguide.zip

2. Image Data Files

The band sequential image files in this data set are named using the following convention:

SPCC_name_num.ext

where

SP   refers to the SPOT satellite
CC   is one of the following continent codes
                    AF = Africa
                    AZ = Australia and New Zealand
                    EA = Eurasia
                    NA = North America
                    SA = South America and Central America
and

name   is the DAAC core site name of the subset
num   is an arbitrary site number
ext   is the file suffix, where **img** refers to the data cube file type, and **hdr** refers to the associated ENVI ascii header file

Each file is comprised of 227 10-day maximum-value composite (MVC) NDVI bands, from May 10, 1998 to May 31, 2004. There are 3 images, or bands, per month. The names designated in the header file contain dates that refer to the end-date of the compositing period. The last compositing period can vary from 8-11 days, depending upon the number of days in the month. The images are 201 lines by 201 pixels in dimension, and are geolocated using the accompanying ENVI header file. The image projection is Albers Equal Area Conic.

3. Satellite data set

This data set is comprised of VEGETATION data from the SPOT 4 platform (launched in March 1998) and the SPOT 5 platform (launched in May 2002).

3.1 Characteristics of the VEGETATION Sensor

The VEGETATION sensor is a multispectral instrument flown aboard the SPOT 4 and SPOT 5 satellite platforms.

The sensor has 4 spectral bands: blue (0.43-0.47 µm), red (0.61-0.68 µm), near-infrared (NIR, 0.78-0.89 µm) and shortwave infrared (SWIR, 1.58-1.74 µm). The red and near-IR bands are used to characterize vegetation; the blue wavelength band is used for atmospheric correction for the other bands.

The 2250 km swath width allows daily imaging of about 90% of the equatorial regions, the remaining 10% being imaged the following day. At latitudes above 35° (North and South), all regions are observed daily.

3.2 VEGETATION Products
There are three types of VEGETATION (VGT) products available:
*   primary products (P), extracted from a single image segment,
*   daily (S1) or ten-day (S10) syntheses; these are mosaics of acquired image segments, respectively for 24h periods and for the last 10 days.
*   vegetation indices (NDVI) calculated from daily or ten-day syntheses.

A MVC synthesis can be delivered with several spatial resolutions. These three products are called S10 for 1 km^2 data, S10.4 for 4 km^2, and S10.8 for a resolution of 8 km^2.

The VGT-S10 (ten day synthesis) products are composited (maximum-value) products. All the segments of this period are compared to pick out the 'best' ground reflectance values. These

products provide data from all spectral bands, the NDVI, and auxiliary image acquisition parameter data. The continental S10-composite data products (spectral band data, data quality layer, and NDVI) are downloaded by the GIMMS group from Vito, Belgium. The individual composite NDVI data for each period are extracted from the S10-HDF file and post processed. The post-processing steps include a reprojection from the native global Mercator projection to other projections, continental and regional subsetting, and incorporation of flags for bad data, clouds, and a land mask. The data flag, cloud and land mask information are obtained from the Status Map (SM) layer (data quality information) included as part of the S10 synthesis product catalogue.

4. Data Description and File Format

The data format for all the binary files is eight bit unsigned, or byte data.

NDVI scaling
The valid range of the eight bit (raw) data values is 3 to 255. A RAW value of zero denotes a land pixel with no NDVI calulated due to quality control flagging (i.e. cloud/snow/ice). A RAW value of 1 is not used in the binary files (this is reserved for the graphics plane). A RAW value of 2 denotes a water pixel.

To convert the RAW values to NDVI:

$$NDVI = (RAW*0.004) - 0.1$$

For example: a RAW value of 125 converts to an NDVI value of $(125*0.004) - 0.1 = 0.4$

There is one image and one header file per site. The image file is comprised of 227 10-day NDVI composites, from May 10, 1998 to May 31, 2004, with 3 composites per month. The bands designated in the header file contain dates that refer to the end-date of each compositing period. The last compositing period will vary depending upon the number of days in the month. The images are 201 lines by 201 pixels in size, and are geolocated using the accompanying ENVI header file. The image projection is Albers Equal Area Conic. The header file is an ascii file, designated with a .hdr extension.

5. Additional Information

Revision Date of this Document:
    September 28, 2004.

Data Access:
    The entire archive of SPOT VEGETATION 1km 10-day files can be downloaded free of charge from the following URL: http://free.vgt.vito.be/

Contact Information:

For more information about the data provided, see the contacts below.

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